BUYER'S GUIDE

ELECTRIC *Stairways*

WESTINGHOUSE

ELEVATOR DIVISION

The information contained in this publication has been prepared to serve as a guide for those concerned with the function of the Electric Stairway in moving people conveniently and economically in stores, banks, office buildings, transportation terminals, factories, restaurants, hotels, and other buildings. Much of this information will assist architects, consulting engineers and building management in the preparation of their plans for Electric Stairways.

Copies of the following Westinghouse publications may be obtained by writing on your letterhead to Westinghouse Electric Corporation, Elevator Division, Jersey City 4, New Jersey.

BUYER'S GUIDE, *PASSENGER ELEVATORS* (B-4572A) • BUYER'S GUIDE, *FREIGHT ELEVATORS* (B-4402) WESTINGHOUSE BALANCED *VERTICAL TRANSPORTATION* (B-4586) • WIDENING FIELD OF *MOVING STAIRWAYS* (B-5265) • WESTINGHOUSE SELECTOMATIC (B-5274)

Table of Contents

ELEVATOR DIVISION

Westinghouse Electric Corporation

Jersey City 4, New Jersey

Introduction

GENERAL *(see figure 1)*

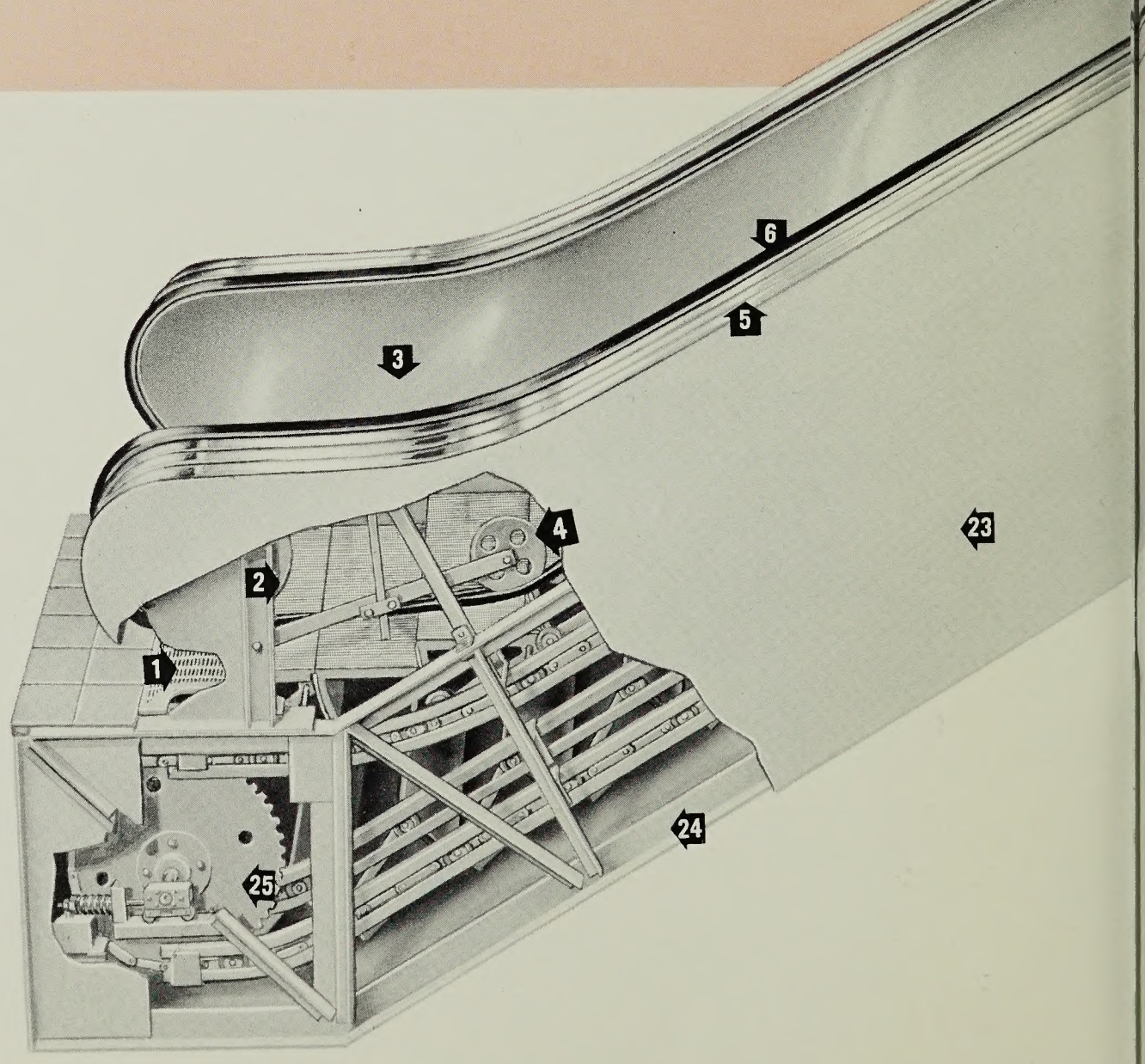
This Guide presents the Westinghouse Electric Stairway. It shows how years of research and development have made these Electric Stairways superior in every respect.

Today, Electric Stairways are being used more and more, not only in stores but in almost every type of building, to handle large crowds of people and to provide convenient interfloor movement of traffic. This constantly increasing use of the Electric Stairway is due to the recognition that it is, in fact, an economical and efficient means of handling crowds of people vertically.

A combination of unique characteristics has easily won this recognition. Not only do Electric Stairways use less space than banks of elevators, but they have very large capacity and are relatively inexpensive to install, operate, and maintain. By providing the means for continuous traffic flow, they handle peaks and valleys automatically. Moreover, they are actually inviting to people because of their striking appearance and the sense of safety and comfort they provide.

SIZES

Westinghouse has available two standard sizes of Electric Stairways, one 32 inches wide and the other 48 inches wide. The 32-inch size has a nominal capacity of 5000 people per hour and the 48-inch size has a nominal capacity of 8000 people per hour. Sizes are selected to suit the traffic requirements *(see figure 2)*.



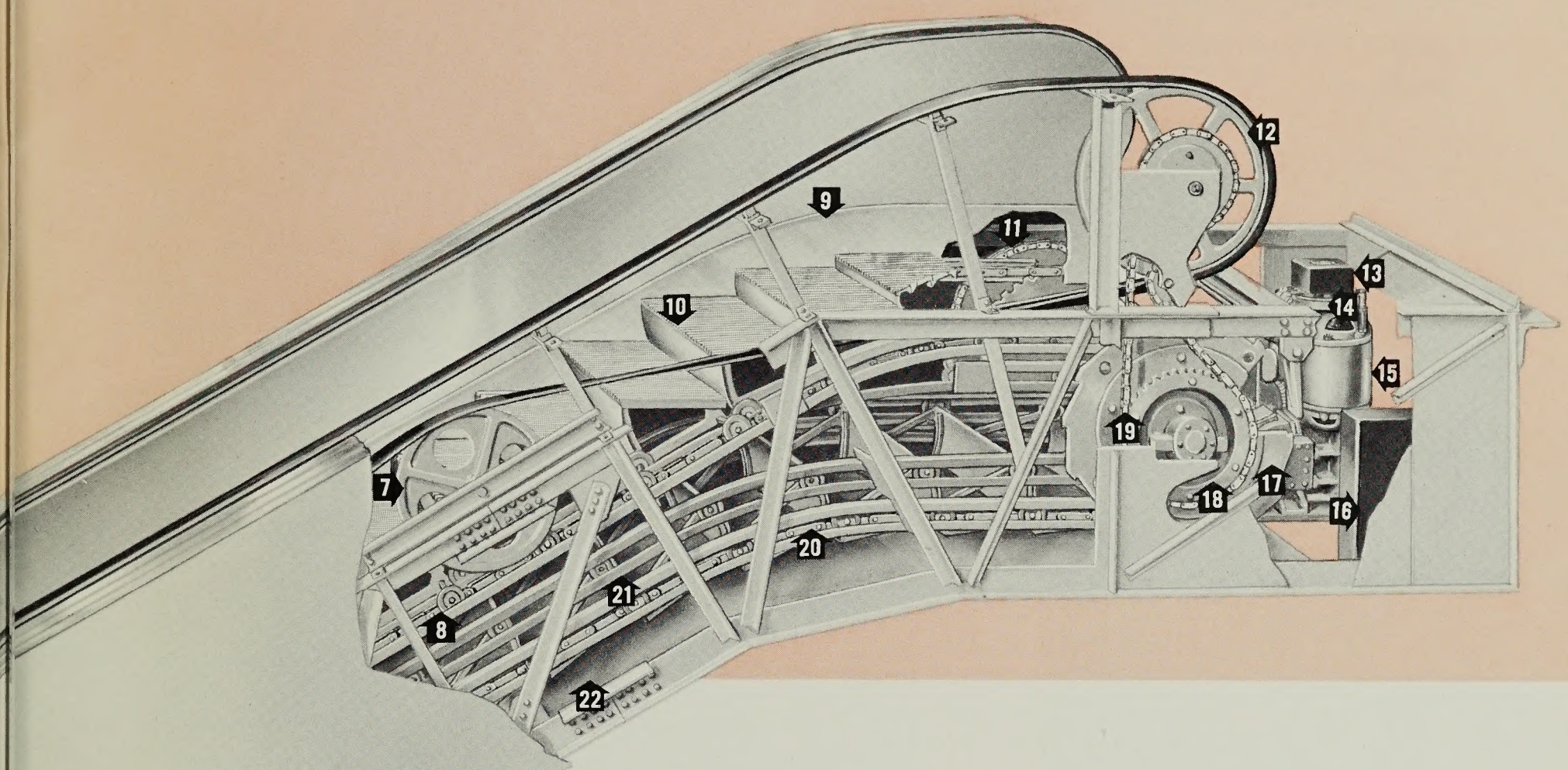


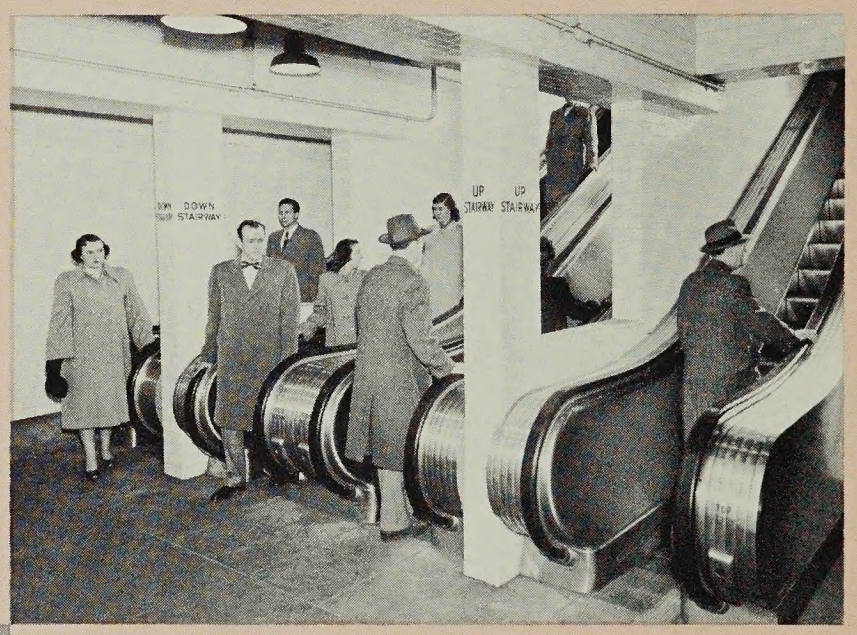
Figure 1. Cutaway View of Typical Westinghouse Electric Stairway

1 COMBPLATE
2 BOTTOM HANDRAIL SHEAVE
3 CONCAVE INSIDE BALUSTRADE
4 HANDRAIL IDLER SHEAVE
5 DECKBOARD
6 HANDRAIL
7 INTERMEDIATE SHEAVE
8 STEP ROLLER
9 SKIRT GUARD
10 STEP
11 MAIN DRIVE CHAIN
12 HANDRAIL DRIVE SHEAVE
13 GOVERNOR
14 SERVICE BRAKE
15 STAIRWAY MACHINE
16 CONTROLLER
17 EMERGENCY BRAKE
18 TOP SPROCKET ASSEMBLY
19 HANDRAIL DRIVE CHAIN
20 STEP CHAIN
21 TRACKS
22 OIL PAN
23 OUTSIDE BALUSTRADE
24 TRUSS
25 BOTTOM SPROCKET ASSEMBLY

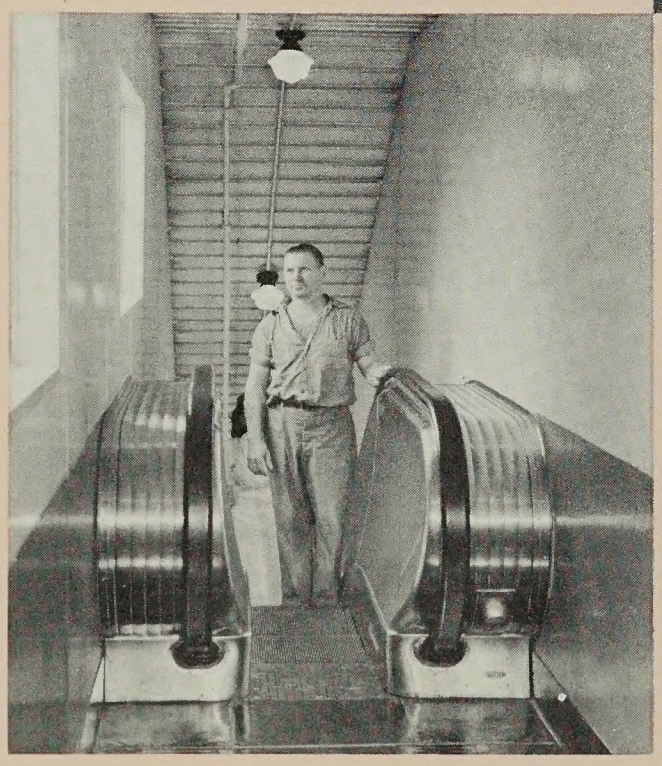
TRANSPORTATION
TERMINAL

OFFICE
BUILDING

STORE



SUBWAY



FACTORY

BANK

Figure 2. Typical Westinghouse Electric Stairway Installations

Component Parts

A. GENERAL

Westinghouse has constantly maintained the quality of its Electric Stairways and their proven features developed through the years. The following discussion will point out these exclusive engineering and construction features, and will show how they incorporate reliability, safety, appearance, low maintenance cost, and long life.

B. TRUSS *(see figure 3)*

1. The truss, which supports every other part of the Electric Stairway, is a welded, built-up steel structure consisting of three sections—a top-end, a center, and a bottom-end section. This truss has a fundamentally correct bridge-type construction designed to withstand all of the stresses and impact loads to which the Electric Stairway is subjected. Its rigid, non-deflecting structure makes possible a permanent track alignment and uniform balustrade joints.

2. An oil pan with overlapping joints is welded inside the full length of the truss.

C. TRACKS *(see figure 4)*

1. The perfectly formed tracks on which the step rollers run are of cold-drawn steel angles. The curved sections are formed in a special stretch-bending machine which produces a final permanent shape. The step rollers are guided laterally by their sides which bear against guides forming part of the track structure.

2. Of particular merit is the comparatively large radius of the curved sections. This large radius not only reduces roller load but provides maximum comfort for the passengers as the steps pass gradually from the horizontal to the 30-degree angle and back to the horizontal formation.

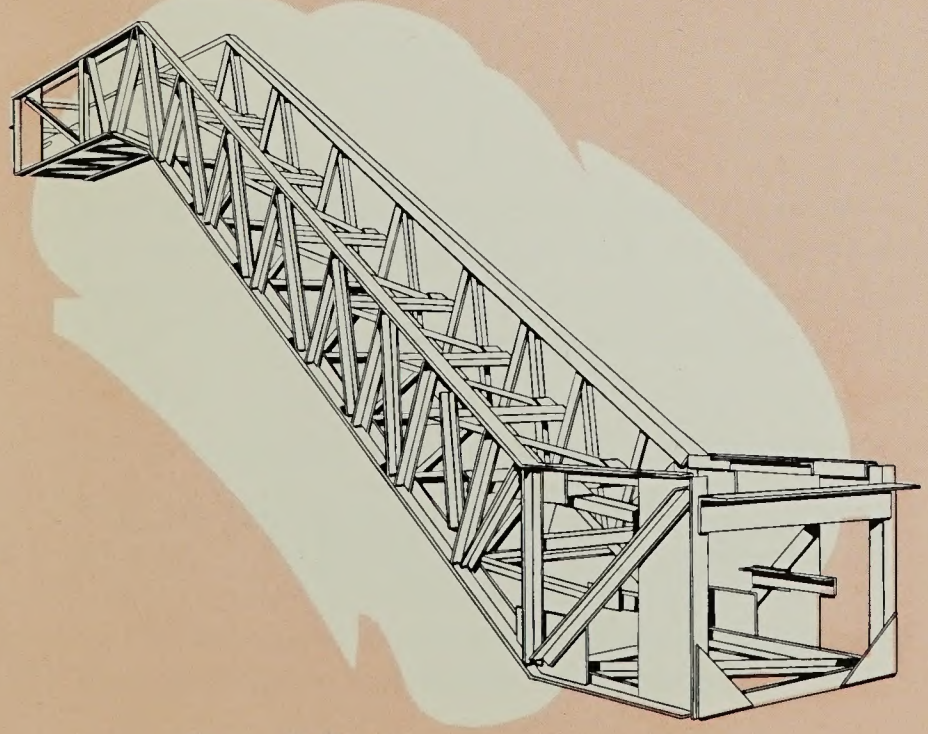


Figure 3. Truss

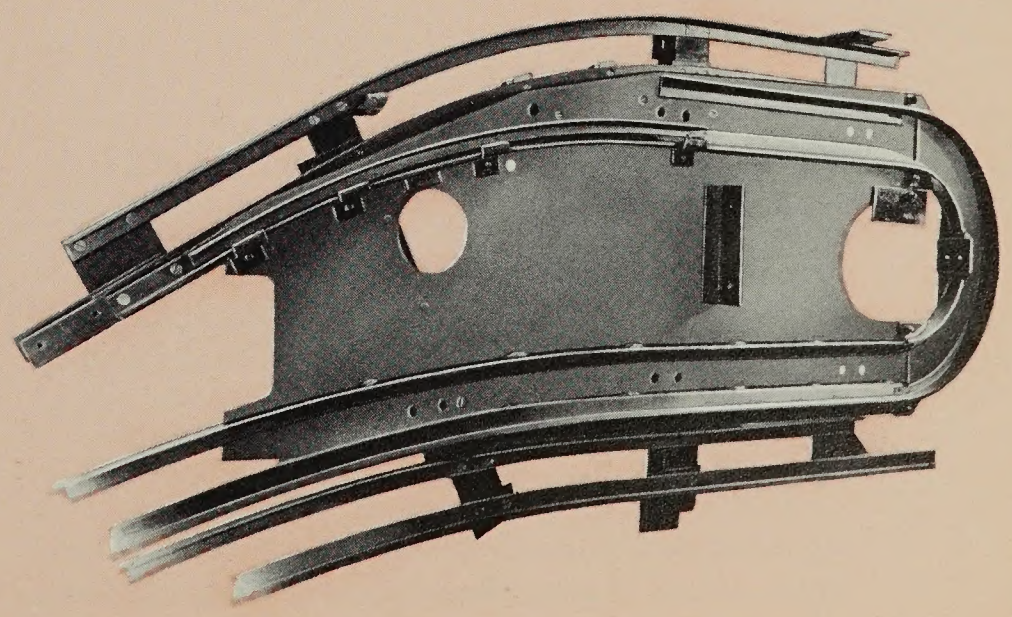


Figure 4. Tracks

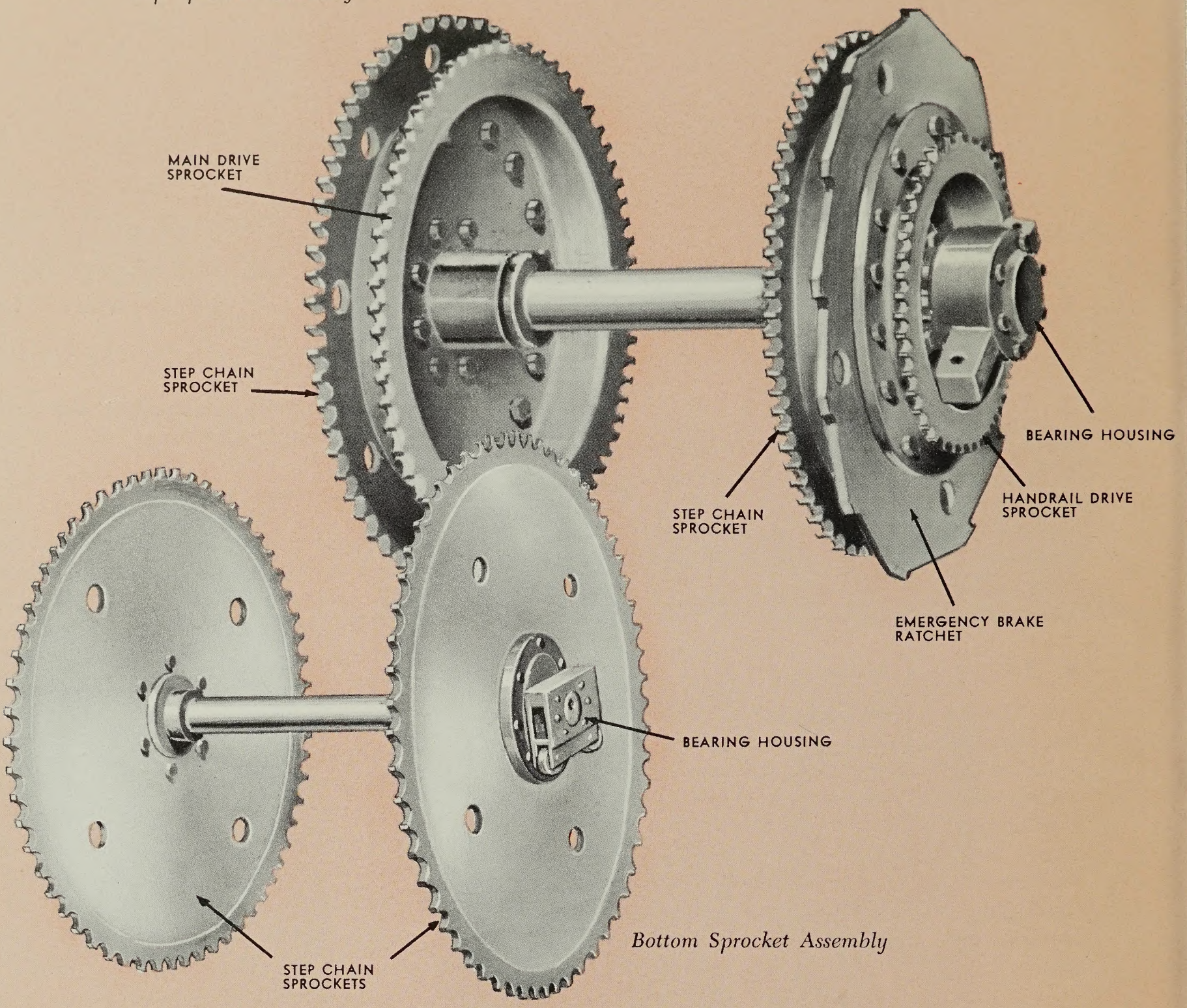


Figure 5. Sprocket Assemblies

D. SPROCKET ASSEMBLIES *(see figure 5)*

1. Two sprocket assemblies are used—one in the top-end section and one in the bottom-end section of the truss. The step chains pass over these sprockets and translate the rotating motion of the machine to the linear motion of the steps. Both sprocket assemblies rotate on Timken bearings.

2. The top sprocket assembly, rigidly supported by the truss, is driven by the machine through a heavy roller chain. The bottom sprocket assembly floats and, by spring action, maintains proper tension of both step chains at all times. Should either or both step chains break or should the steps jam, the floating assembly will move to trip a switch which will cut off the power and set the service brake.

E. MACHINE AND DRIVE *(see figure 6)*

1. The machine is a compact vertical unit designed for mounting in the top-end section of the truss to conserve space and to minimize the building framing. It is powered by a specially developed Westinghouse *Life-Line* motor which has a relatively low

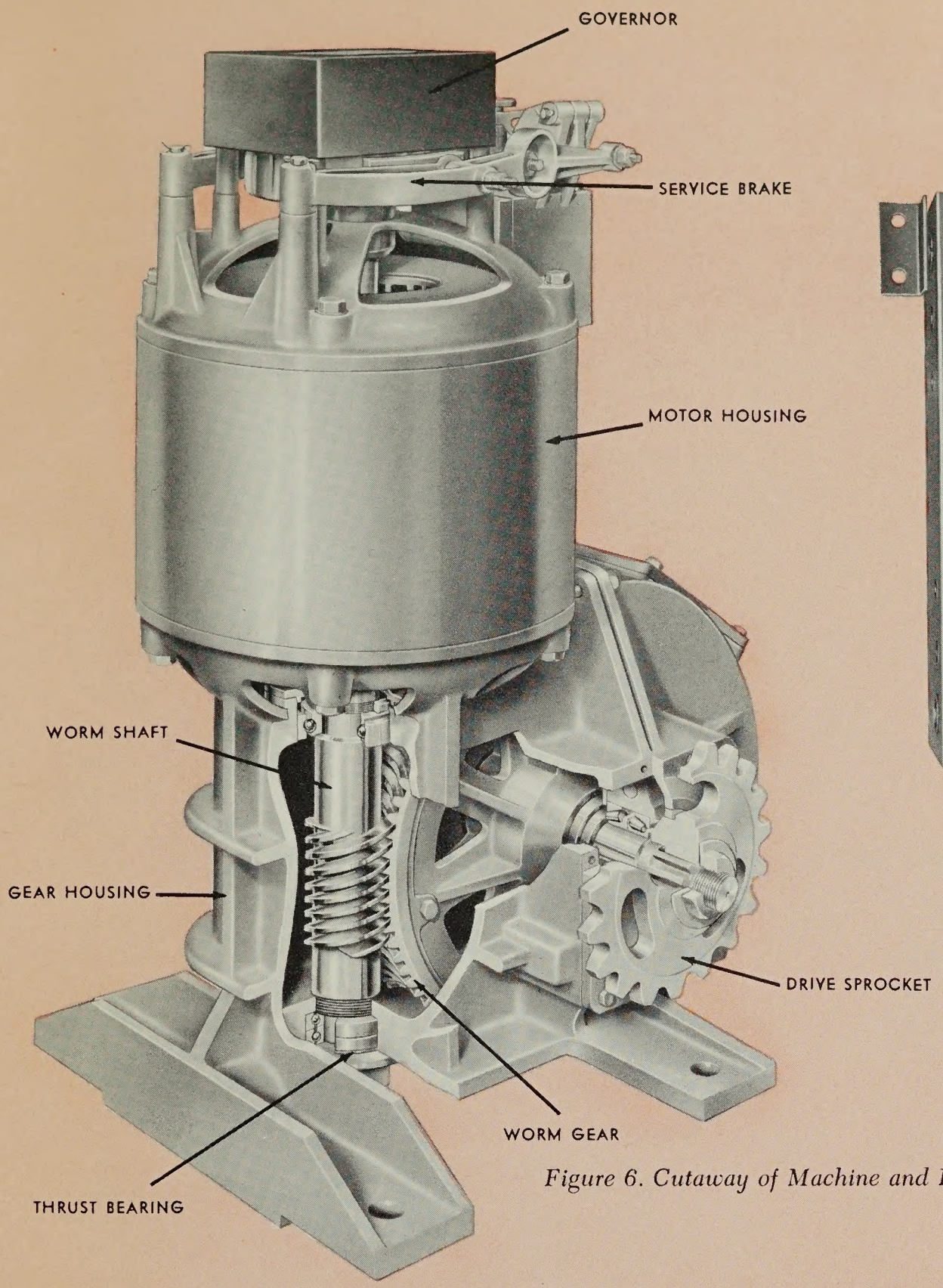


Figure 6. Cutaway of Machine and Drive

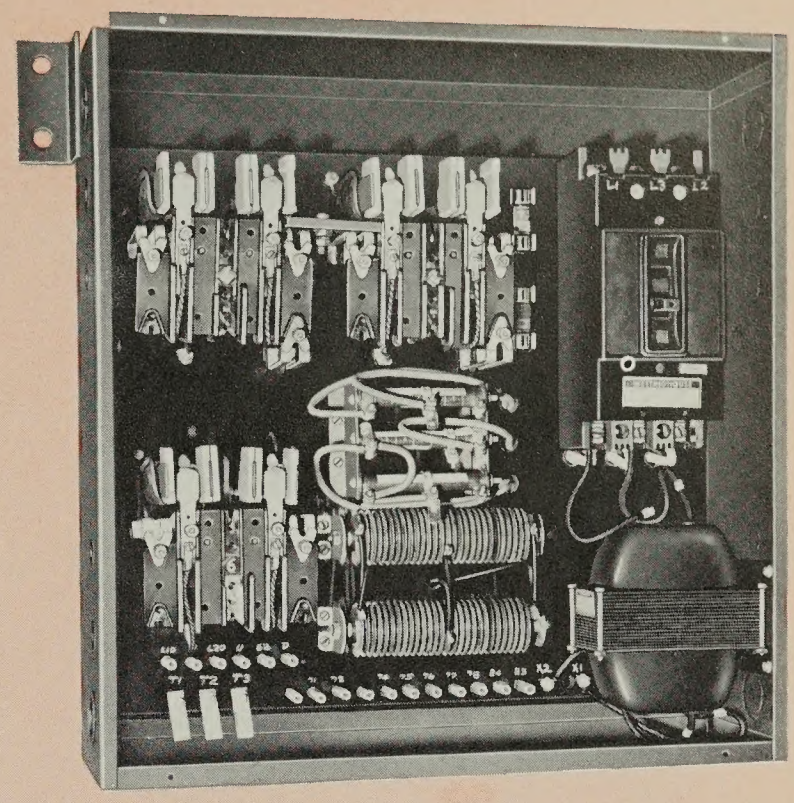


Figure 7. Controller

speed (850 rpm). This low speed results in a lower gear ratio, less wear, and less noise. The main thrust and motor bearings are the anti-friction type. The gear housing is a rugged one-piece casting.

2. A heavy roller-chain transmits power from the machine drive-sprocket to the top step-chain sprocket. This provides flexibility which permits wear-free and noise-free operation even when shifts in building structure cause misalignment.

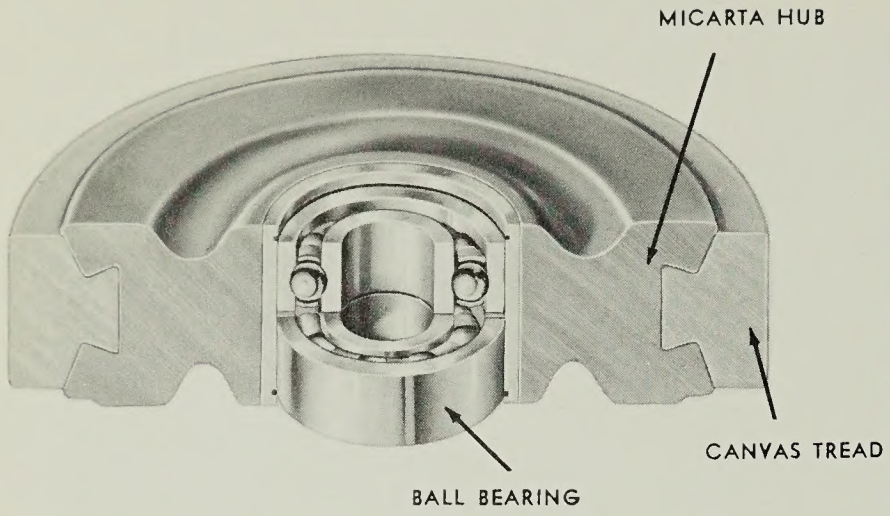
3. An elevator-type service brake is mounted on the high-speed motor shaft. (Refer to paragraph L.)

4. A governor, when required is assembled on top of the motor. (Refer to paragraph L.)

F. CONTROLLER *(see figure 7)*

1. The controller is generally located next to the machine and drive. It may also be located in the balustrade near the top newel.

2. Controller equipment consists of a circuit-breaker-and-overload relay, magnetic contactors, and a selenium rectifier.



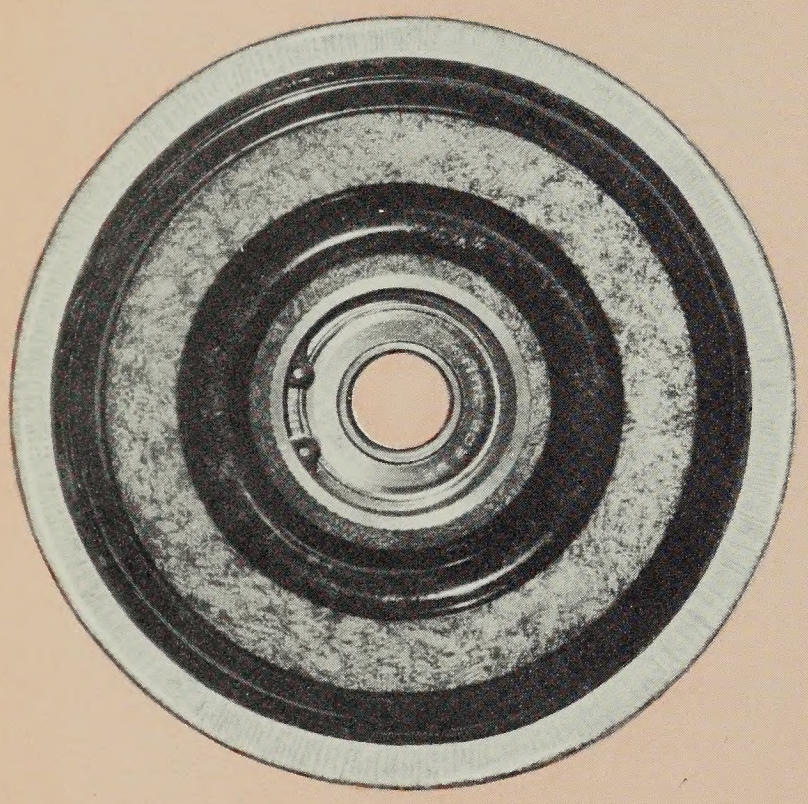


Figure 8. Step Roller

G. STEP ROLLERS *(see figure 8)*

1. Four rollers per step are used. This minimum number is specially desirable from a maintenance standpoint. The rollers are mounted on the step axles in such a way that they can be removed at any time without disassembling the step chains. The rollers travel on two tracks which control the shape of the step formation.

2. The step rollers are strong, lightweight, long-lived; require no lubrication, and have cushion treads. They rotate on ball bearings which are pre-lubricated for the life of the bearings.

3. The load-carrying rollers have canvas-on-edge treads which have sufficient compressibility to allow ample distribution of the imposed loads, particularly as the steps go over the top and bottom curved sections of the tracks. The treads are bonded and keyed into micarta hubs.

4. The trailing rollers have rubber treads bonded to steel hubs.

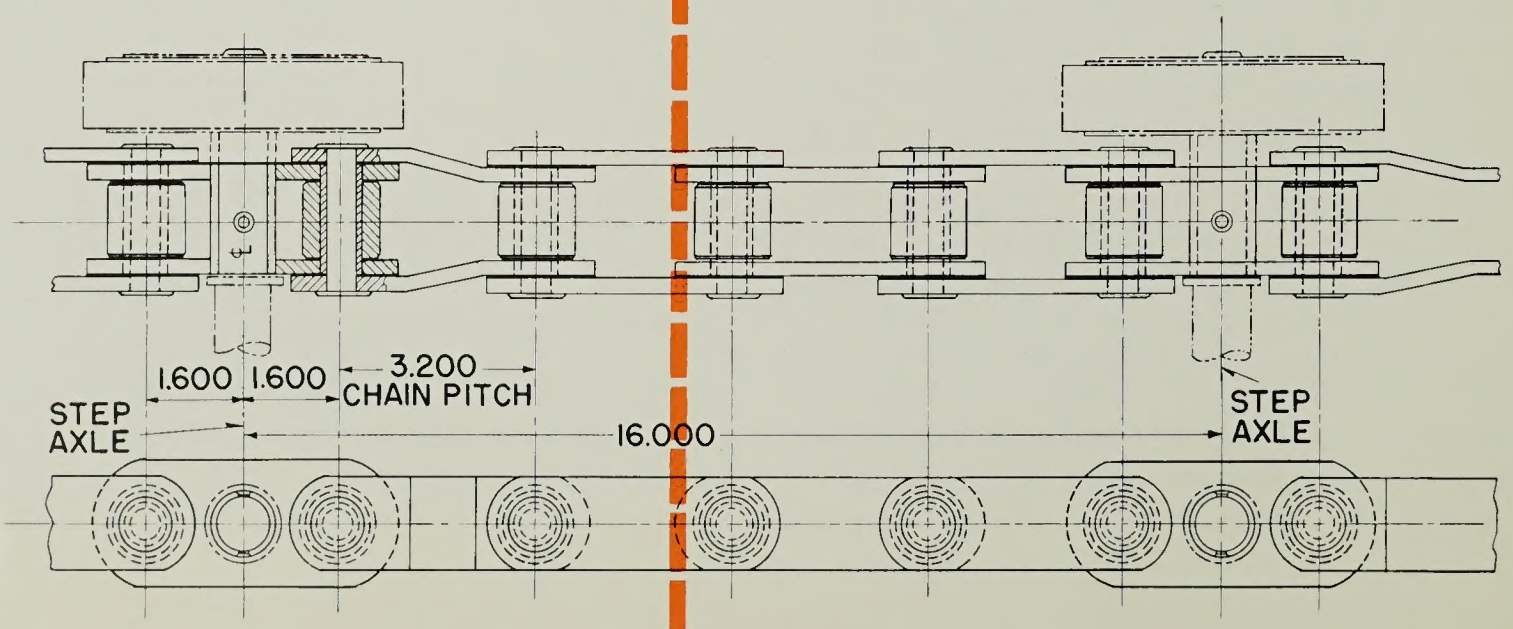
5. Relatively large 5¼-inch diameter rollers are used to minimize the unit loading and to keep the roller *rpm* to a reasonable value (65 rpm).

H. STEP CHAINS *(see figure 9)*

1. The step chains are the members to which all of the steps are attached and by which they are driven. Two, small pitch, precision, roller-type, steel chains are used. These chains are made to maintain exact relationship between steps and to engage the top and bottom sprockets. Correct chain tension is maintained automatically by springs acting on the bottom sprocket assembly.

2. The sprockets have an odd number of teeth and a tooth pitch one-half the chain pitch. Consequently, the teeth used for driving the step chains alternate every revolution, resulting in reduced and more uniform wear.

Figure 9. Step Chain



I. STEPS *(see figure 10)*

1. The steps, designed for safety and comfort, are light but strong. Deep aluminum frames and fine-pitch tread boards provide a stable platform for even the smallest heel. The risers are solid, die-formed, reinforced steel, and are coated on the back with sound-deadening material.

2. Any exposed step can easily be removed for maintenance. Also, step treads can be removed separately.

3. For quietness, rubber bushings are used at the points where the step brackets are clamped to the step axle.

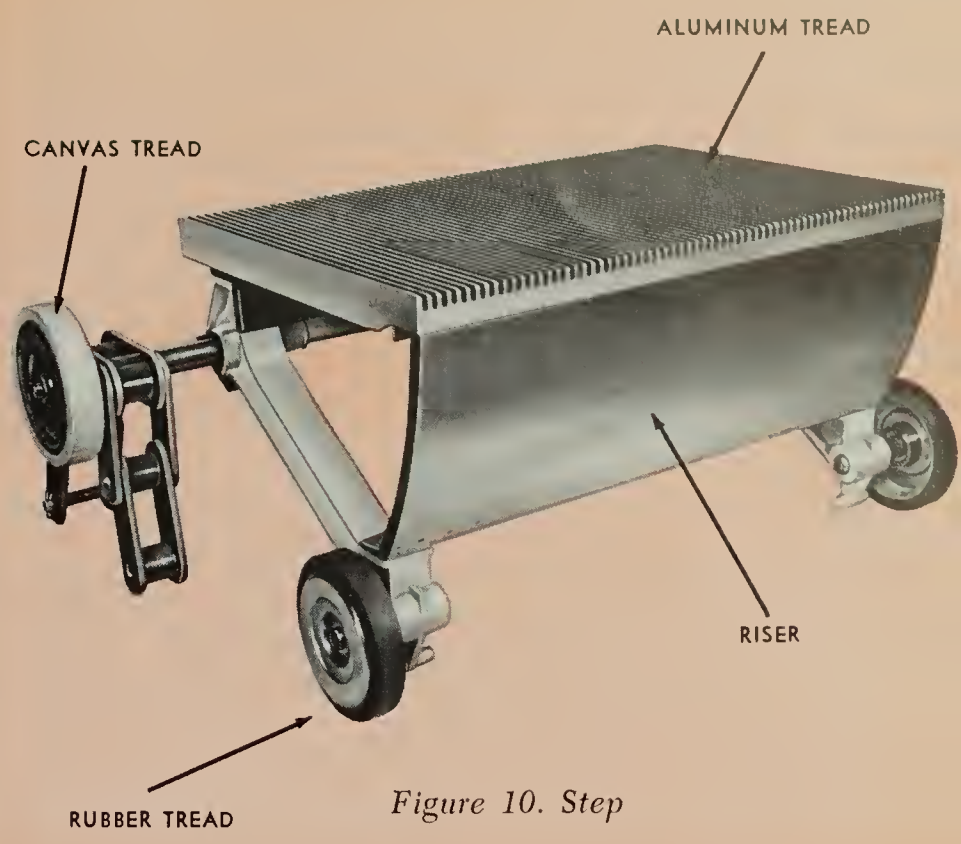


Figure 10. Step

J. HANDRAILS *(see figure 11)*

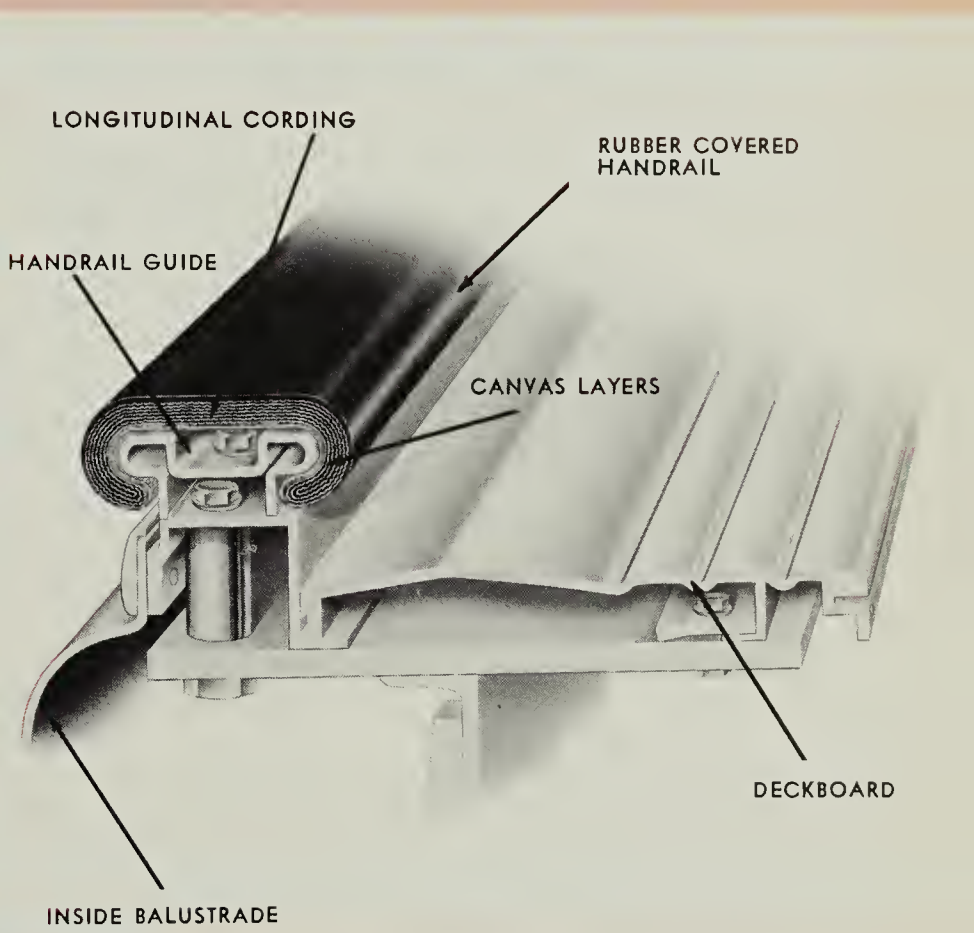
1. To avoid deterioration the handrails, made of canvas and rubber, are installed with no reverse bends. They are sturdy and durable, trouble-free, and easy to keep clean. Joints are vulcanized to provide a continuous, smooth rubber surface. Longitudinal cords in the canvas substantially eliminate stretch and prolong life.

2. The handrails travel on guides in synchronism with the step treads. They are designed and arranged to allow a person to grasp them naturally for easy adjustment to the speed of the steps, and to maintain a grip on them until the person's feet are well established on the exit or entrance landing.

3. The handrails are traction-driven and easily follow paths around the newels. They enter the balustrade at points near the floor level where the handrails are practically horizontal. This design removes the opportunity and inclination for anyone sticking a hand into the openings which, nevertheless, are protected by a suitable guard.

4. Handrail guides. The handrail guides are fastened to the balustrade and conform to its curvature. The guides are adjusted to maintain a close uniform clearance between the handrails and balustrade to eliminate pinching of fingers.

5. Handrail drive. Each handrail passes over two main sheaves, one at the top and one at the bottom of the stairway. The two top sheaves are driven by a single jack shaft, which in turn is driven by a chain from the top sprocket assembly. These sheaves have vulcanized rubber rims. The friction between the rims and the canvas of the handrails provides the driving traction. An intermediate sheave is provided for each handrail to permit adjustment of its tension.



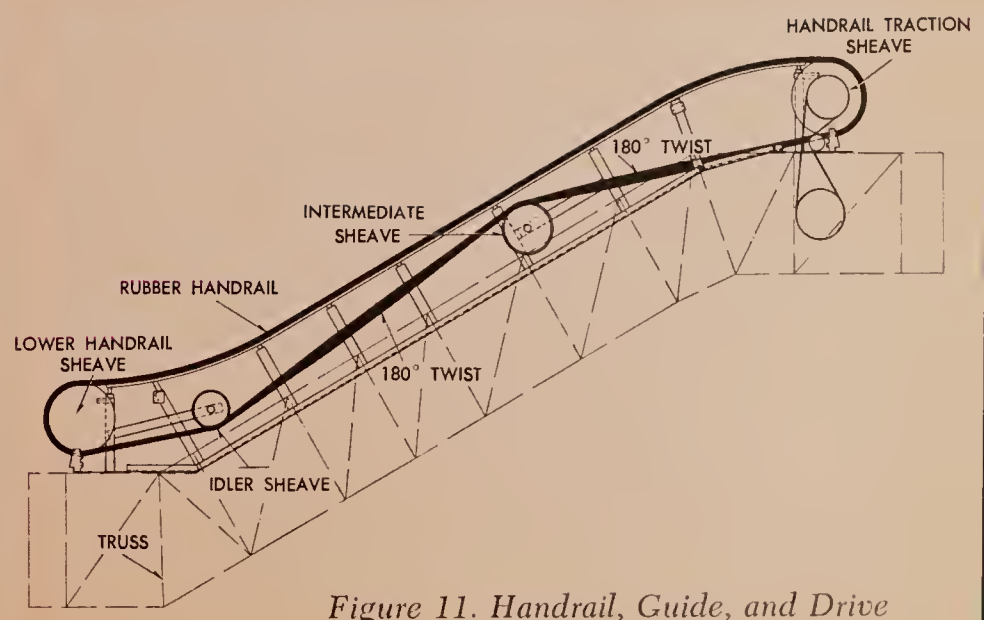
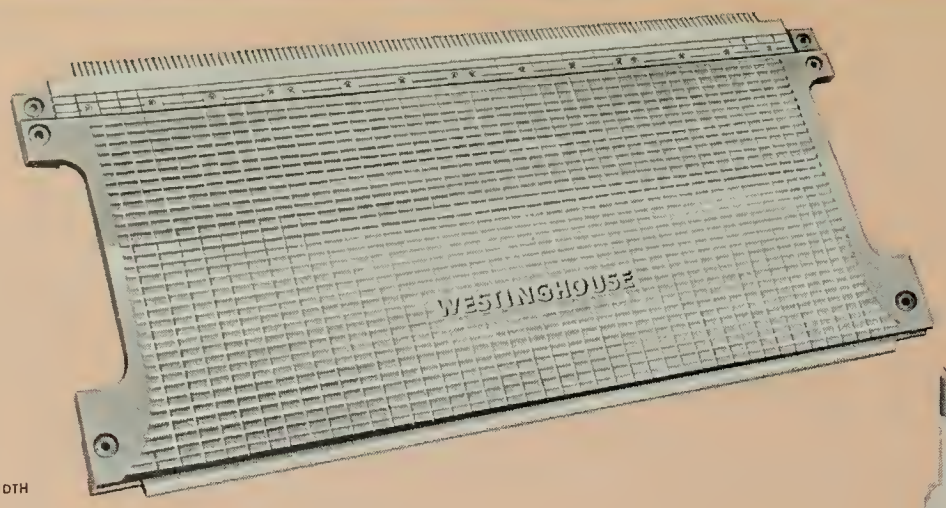


Figure 11. Handrail, Guide, and Drive

Figure 12. Combplate



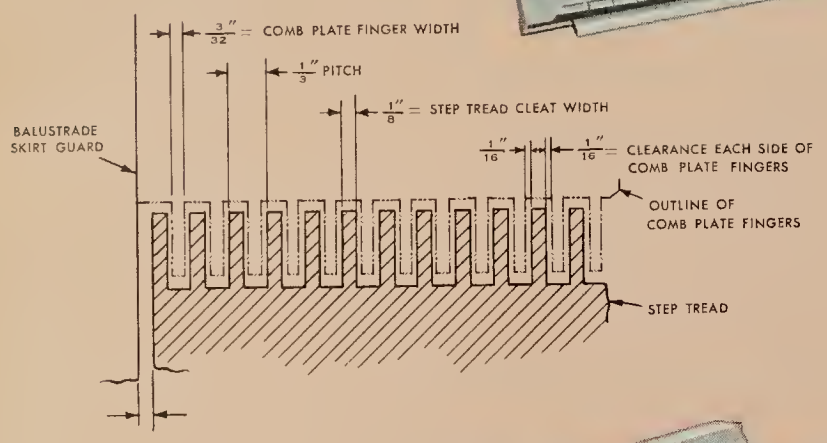


Figure 13. Service Brake

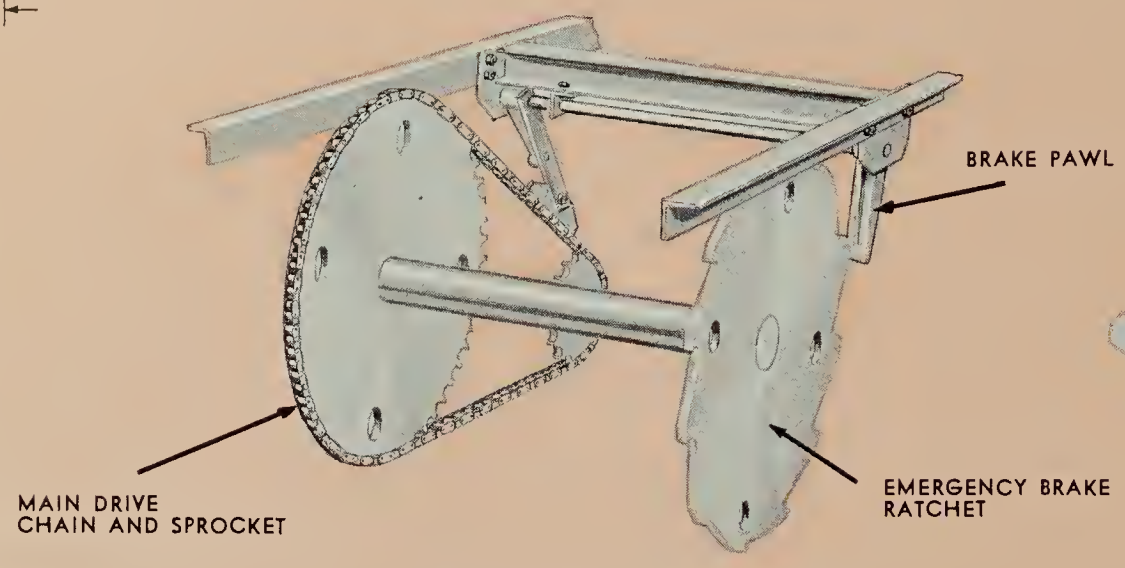


Figure 14. Emergency Brake

K. COMBPLATES *(see figure 12)*

1. Combplates at the top and bottom landings allow the transfer of people safely to and from the moving steps. Their low angle of incline permits the feet of those who do no step off the steps to ride smoothly on to the stationary combplate. They are trip-proof and, except for the finger-area, have a non-skid surface.

2. The combplate finger sections are readily renewable. The fingers are made of a material so that should foreign material jam against them, they will break rather than bend up to become a hazard. The steps and combplates are designed with minimum running clearance to avoid the possibility of catching objects on the steps.

L. BRAKES

1. Service brake *(see figure 13)*

a. The service brake is mounted on the high-speed motor shaft. Acting at this point through the reduction gears rather than on the low-speed sprocket, consequently the stops are soft and smooth.

b. The service brake is applied when any of the several safety circuits open. These circuits are opened by the stop button, the overload relay, the speed governor, or the step-chain tension switches.

c. The brake is so designed that it can stop a fully or lightly loaded stairway without appreciable jar to the passengers.

2. Emergency brake *(see figure 14).* For additional protection, an emergency brake is mounted on the shaft of the top sprocket assembly (referred to on figure 5). It is mechanically applied and will bring the loaded stairway to a safe stop if the main drive chain between the machine and the top sprocket should break for any reason. This brake will hold the full load securely until manually released.

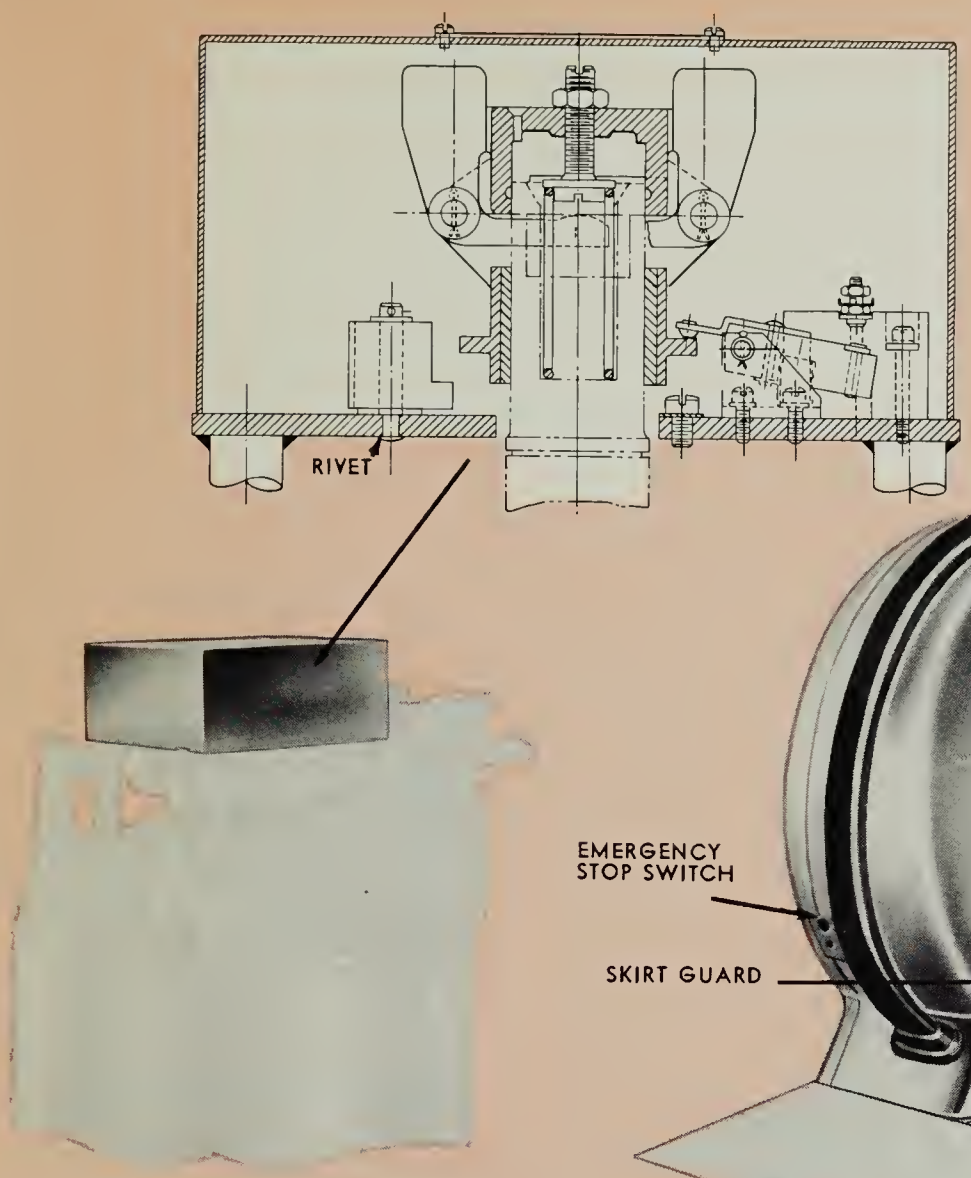


Figure 15. Governor

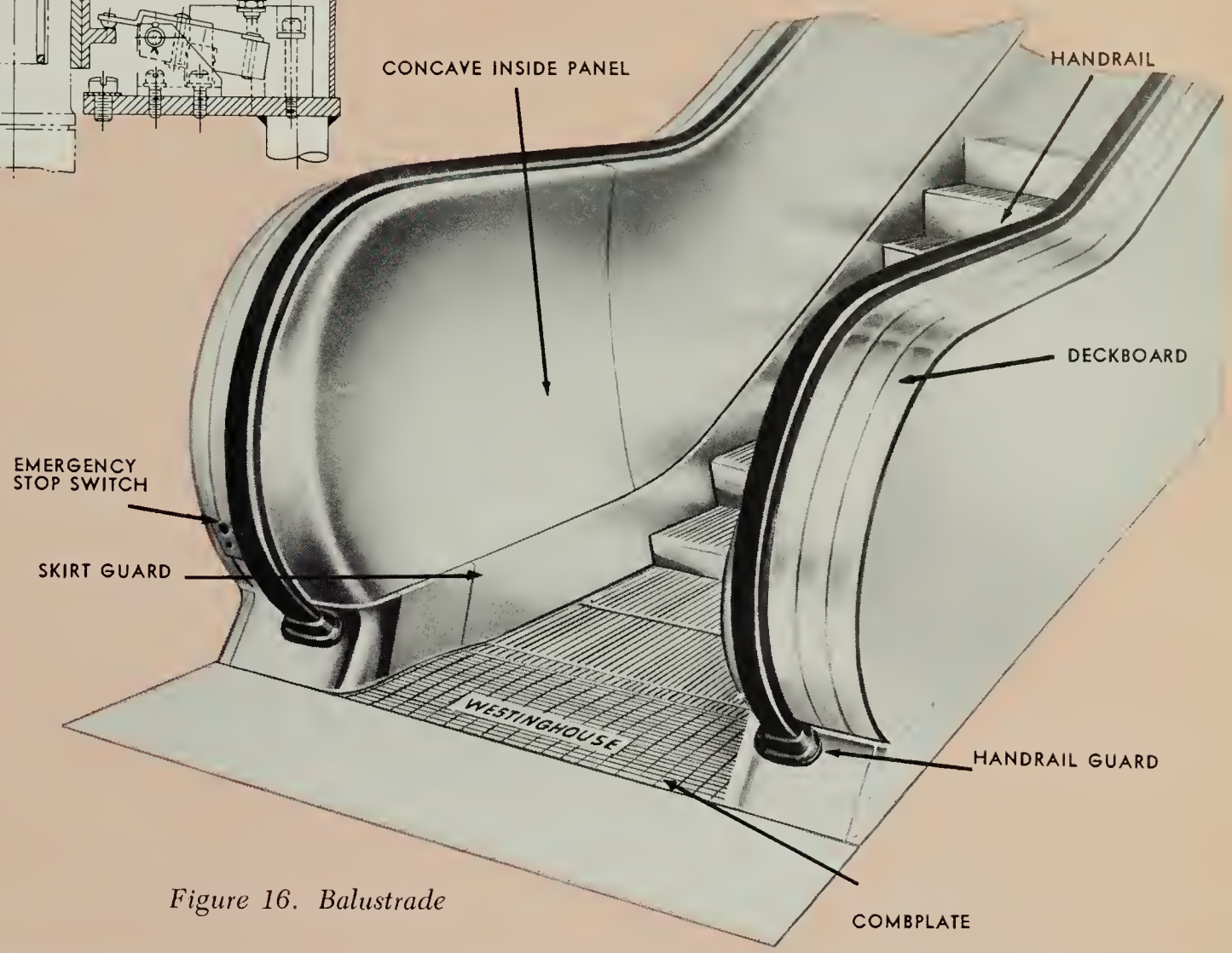


Figure 16. Balustrade

3. Governor *(see figure 15).* When required by code a sensitive speed governor, driven by the motor shaft, is mounted on top of the motor. It cuts off power and applies the service brake in case of overspeed or underspeed. The underspeed protection prevents accidental reversal of the stairway.

M. BALUSTRADE *(see figure 16)*

1. The balustrade provides the final enclosure for the Electric Stairway. It consists of inside panels, skirt guards, deckboards, and mouldings. It is of the streamline-type with extended newels at the top and bottom landings.

2. The standard metal inside panels are concave. They are attached firmly to steel brackets and are coated on the back with sound-deadening material. The concave design provides maximum passenger space as well as an attractive streamline appearance.

3. The standard balustrade is alumilited buffed aluminum. However, balustrades can be provided in white or yellow bronze, stainless steel, wood veneer, rigidized steel or porcelain enamel. Also other special panels are available.

4. The skirt guards are adjustable for close clearance to the sides of the moving steps.

5. The newels are extended to permit passengers to grasp the handrails before reaching the moving steps and to retain their grasp while leaving the steps. The full semi-circular construction of the newels places the handrail openings close to the floor and beyond the reach of the curious.

NOTE: The upper and lower truss ends are provided with a covering to take the selected flooring. The upper truss end is also provided with a manhole for access to the machine room.

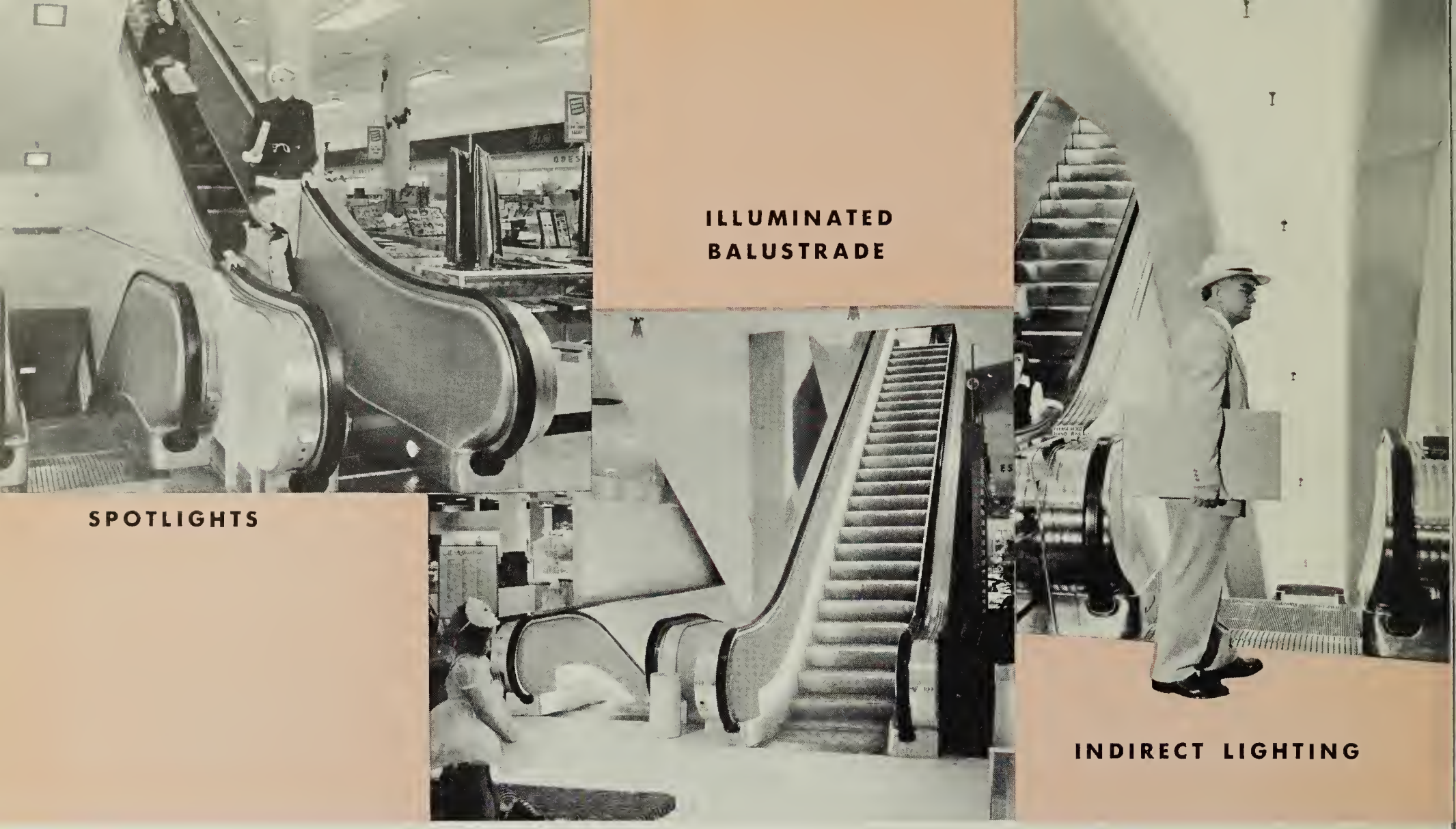


Figure 17. Lighting

N. LIGHTING *(see figure 17)*

1. Proper illumination of Electric Stairways is essential. The particular treatment is determined by the architect who considers not only the stairway proper but also its surroundings.

2. Usually, lights are placed in the underside of the stairway above. These vary from individual spotlights properly spaced, to the use of troughs with slim-line fluorescent lamps to give continuous indirect lighting.

3. Recently, balustrades containing variations of illuminated designs have come into use. These provide illumination and are decorative as well.

O. LUBRICATION

Lubrication of moving machinery is always necessary. However, in the Electric Stairway, this requirement has been kept to a minimum.

1. Bearings are the grease-packed, anti-friction type which require little or no lubrication. The packed and sealed step-roller bearings will outlast the rollers themselves. The bearings may be removed from the worn rollers and reused in any roller replacement.

2. A few applications of grease once a year to other bearings are adequate.

3. At periodical intervals the step chain is manually lubricated by releasing the petcocks on the oil reservoirs.

P. SAFETY FEATURES

1. The Electric Stairways are designed and installed with every necessary safety feature.

2. The extended newels, in conjunction with the handrails traveling at the same speed as the steps, make it safe and easy to get on or off the stairway. Moreover, a step-and-a-half level at the combplates allows sufficient time for passengers to properly place their feet on a step.

3. Steps are large, stable, and provide sufficient friction to prevent slipping.

4. The balustrade skirt panels are rigid and adjustable for close-running clearance to the sides of the step treads.

5. Safety circuits and the service brake bring the stairway to a smooth stop in the event of a failure.

6. Handrails disappear into the balustrade at inaccessible points.

Q. WELLWAY PROTECTION

The following description of various methods of wellway protection outlines general requirements and is not intended to recommend one method over another. Reference should be made to codes and other published data for details and specifications.

a. SMOKE-GUARD METHOD *(see figure 18).* This method consists of a fireproof smoke guard around the wellway opening at each floor. The smoke-guard extends about 18 inches below the ceiling. Sprinkler heads are located approximately four feet apart around the guard. Each head is protected by a shield so that its operation will not be prevented by the operation of adjacent heads.

b. SPRAY-NOZZLE METHOD. This method is similar in arrangement to the smoke-guard method *(see figure 18),* except that nozzles producing a high-velocity water spray are used around the wellway openings instead of the usual sprinkler heads. This method depends primarily on a deep, fine-spray water curtain or barrier which provides an effective counter-draft action to smoke. Operation may be initiated by temperature, smoke, or other conditions. All nozzles in the affected area operate simultaneously.

c. ROLLING-SHUTTER METHOD *(see figure 19).* This method depends upon a rolling-type shutter, made of incombustible material, which operates on a railing about three feet high at the upper end of the stairway opening. The shutter may be closed manually or by power. If power operated, the closing may be initiated by temperature, smoke, or other conditions. An 18-inch smoke guard is also usually provided.

Figure 18. Smoke-Guard Method of Wellway Protection

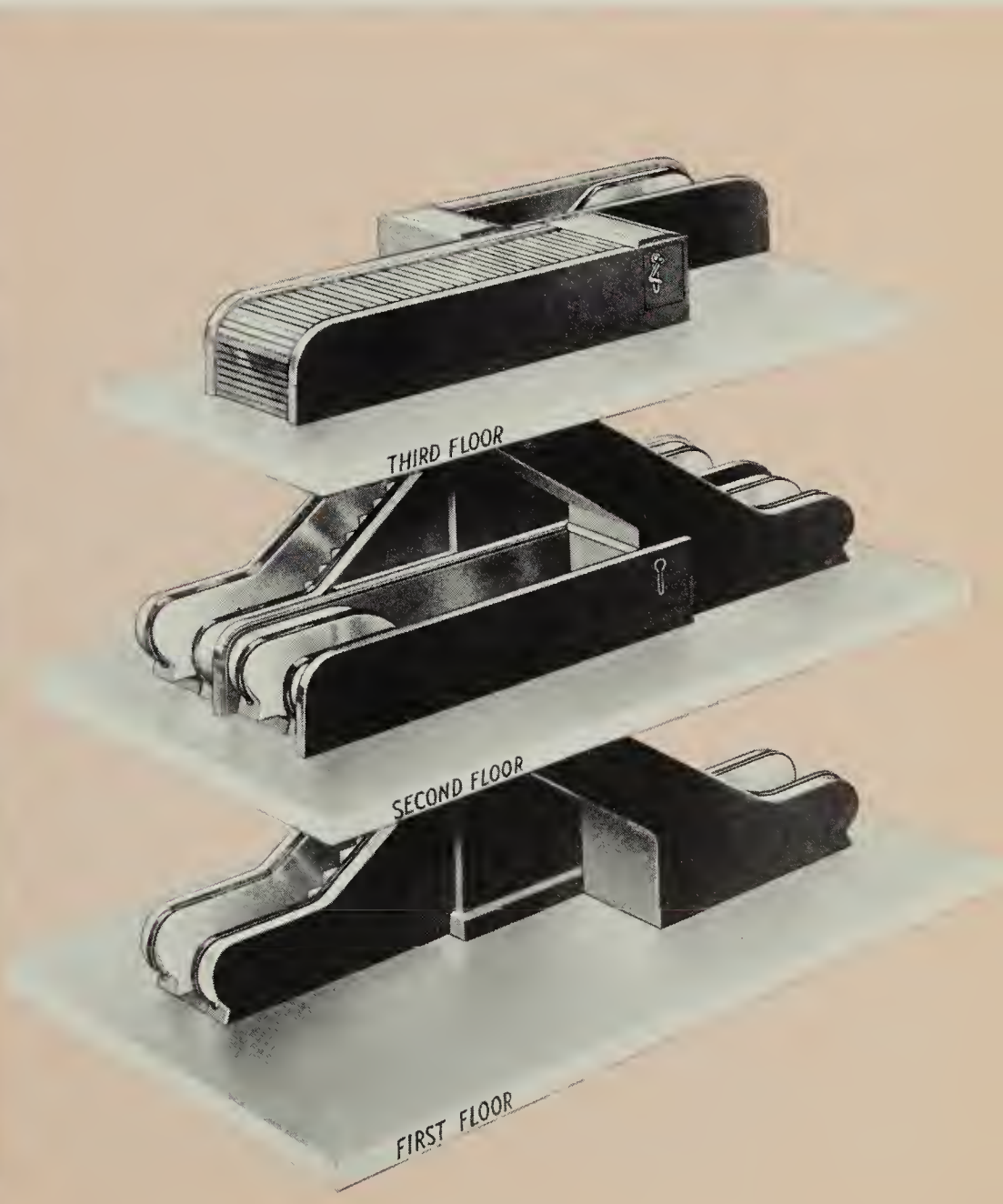


Figure 19. Rolling-Shutter Method of Wellway Protection

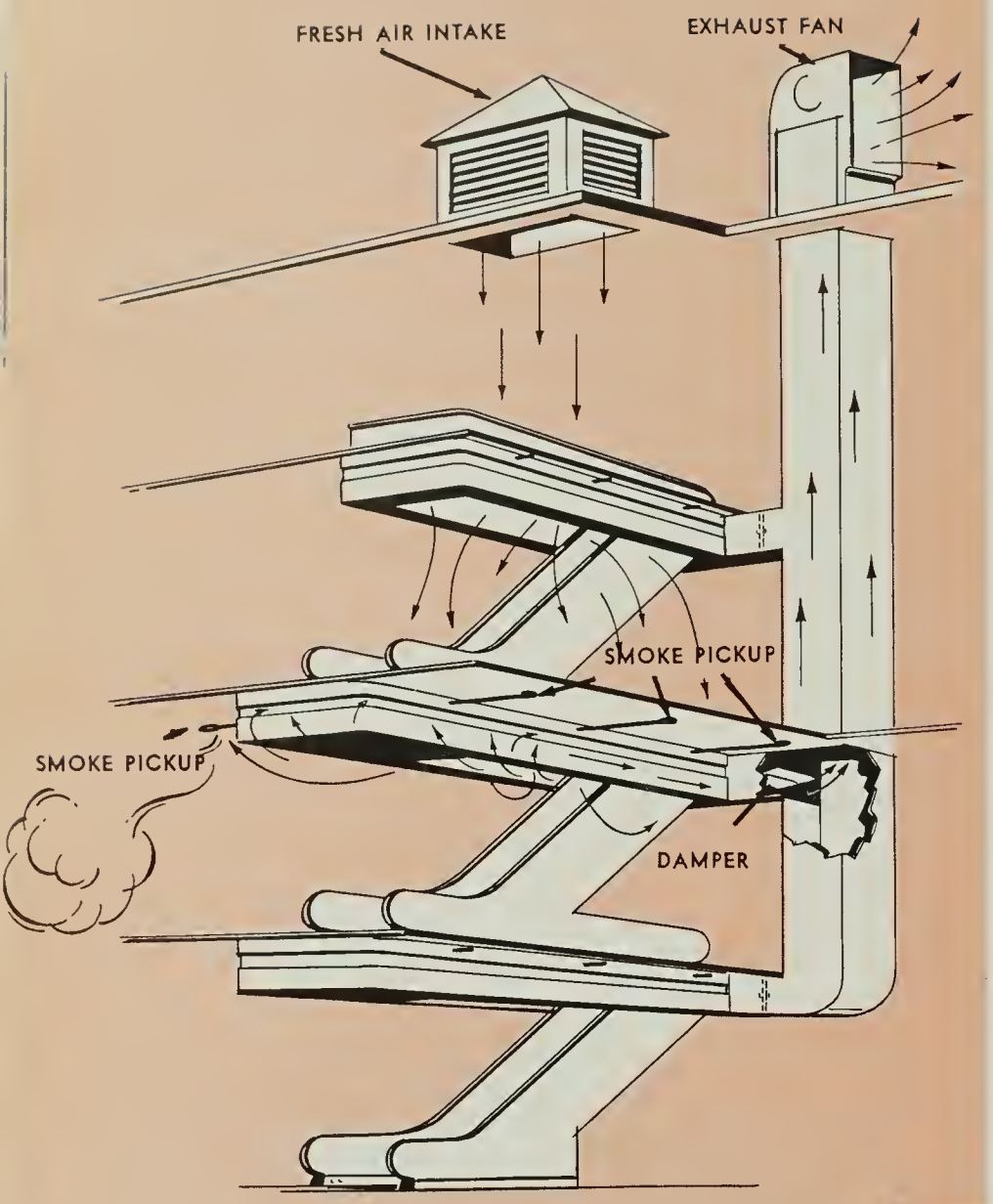


Figure 20. Sprinkler-Vent Method of Wellway Protection

d. SPRINKLER-VENT METHOD *(see figure 20)*. This method consists of an exhaust system, separate from the ordinary building ventilating system, with suitable ducts, flues and dampers to draw out air, smoke, and gases in case of fire; and an intake through which fresh air can enter the building. When in operation, a down-draft is created through the wellway, and gases and smoke are exhausted from each floor affected. The operation of the system is initiated by a thermostat in the floor involved or by such devices as required for automatic fire detection. In addition, there is a smoke guard and a water-spray system located around the stairway openings and controlled by thermostatic devices properly spaced to respond to advancing heat. Under conditions of excessive heat, this system will automatically create an effective water curtain from the ceiling to the floor.

e. TOTAL-ENCLOSURE METHOD *(see figure 21)*. This method completely encloses each wellway with fire-resisting material. Doors, required at each landing, are normally open but will close automatically through the operation of fusible links. With this method, it is difficult for the customer to find the transportation system. Also, the customers cannot view the merchandise while riding the stairways.

Figure 21. Total-Enclosure Method of Wellway Protection

Available Sizes

A. GENERAL

1. Two standard sizes of Electric Stairways are available. They are designated as type 32L and type 48L, and are similar in every respect except in width and rated capacity.

2. These Electric Stairways, built with quality materials and fine engineering, have become the recognized standard of the industry. Their graceful, streamlined appearance adds to the beauty of any building and they are easily installed under various architectural arrangements at minimum expense.

3. Both sizes have a speed of 90 feet per minute.

NOTE: Speeds up to 125 feet per minute are permitted by most codes. Where specified, these stairways can be furnished to operate at such speeds.

Where the rise is above 23 feet, special designs are available.

B. TYPE 32L *(see figure 22)*

The 32L Electric Stairway is 32 inches wide between balustrades. The steps are 24 inches wide and 16 inches deep and can easily accommodate an adult and a child. The rated capacity of this stairway is 5000 persons per hour.

C. TYPE 48L *(see figure 23)*

The 48L Electric Stairway is 48 inches wide between balustrades. The steps are 40 inches wide and 16 inches deep and can easily accommodate two adults. The rated capacity of this stairway is 8000 persons per hour.

Figure 22. Type 32L Electric Stairway

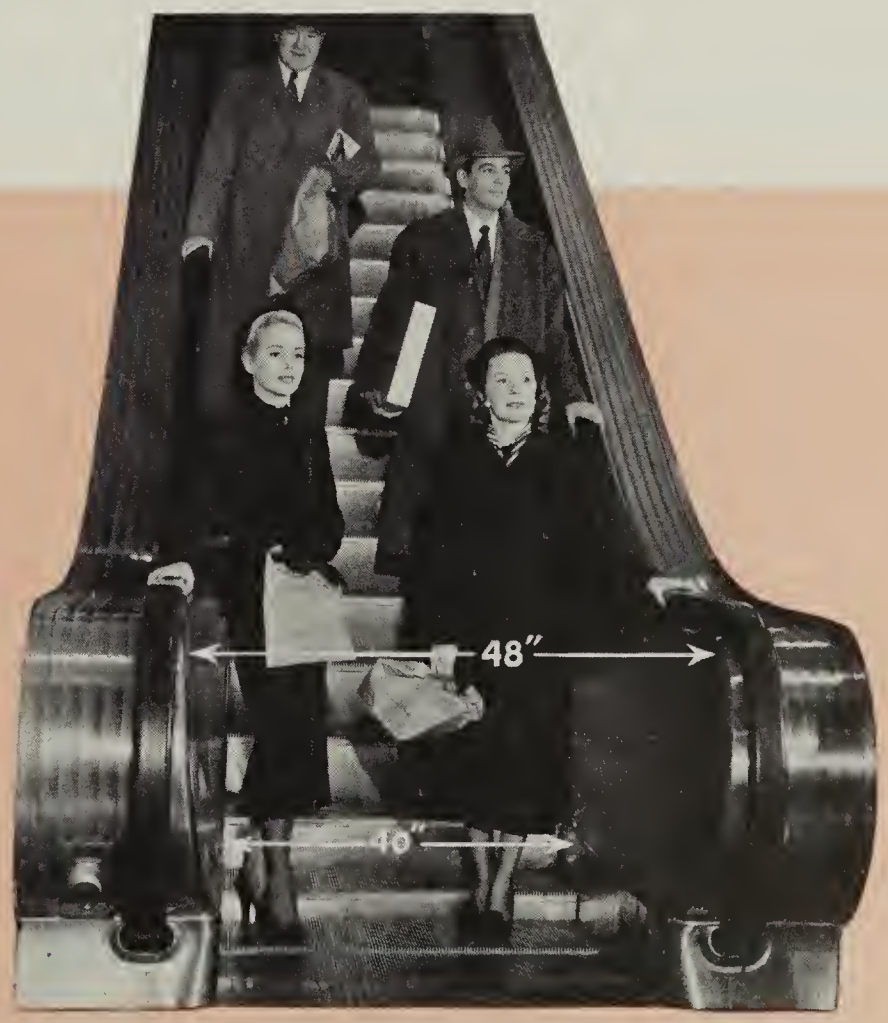


Figure 23. Type 48L Electric Stairway

Budget Price Data

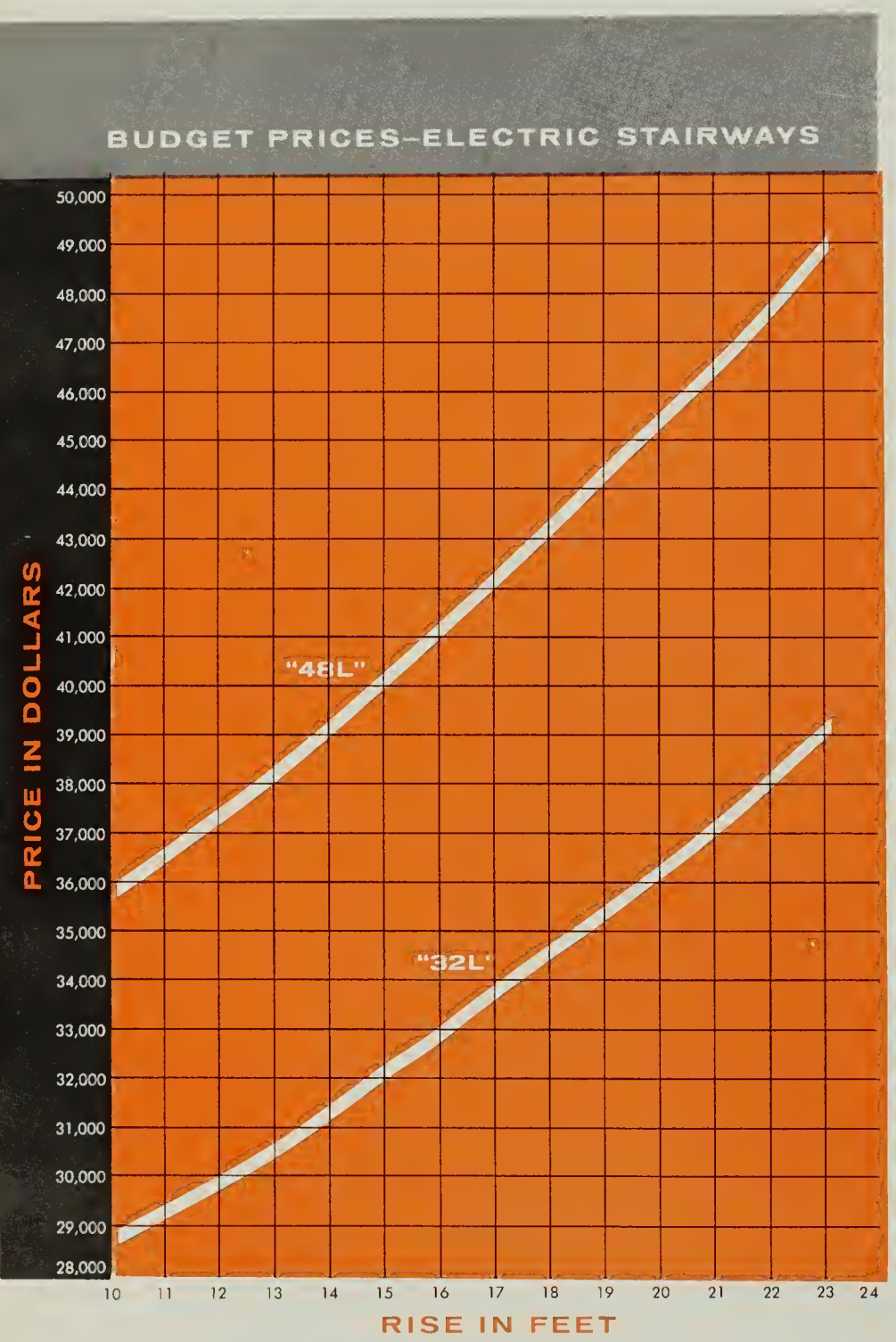


Figure 24. Price Curve for 32L and 48L Electric Stairways

A. GENERAL

The basic information for calculating budget figures for the two standard sizes of Westinghouse Electric Stairways is presented in figure 24.

NOTE: Prices given in this section are approximate and will vary with field labor rates. They are for use as a guide only and are not to be used for quotations.

B. EXAMPLE

1. Assume that in a given building two 48L and four 32L stairways are to be installed; the rise for the 48L stairways is 16 feet; the rise for the 32L stairways is 14 feet.

2. From the upper curve (figure 24), one 48L stairway for a rise of 16 feet will cost approximately $41,200.00. Consequently, two such stairways will cost $82,400.00.

3. From the lower curve (figure 24), one 32L stairway for a rise of 14 feet will cost approximately $31,300.00. Consequently, four such stairways will cost approximately $125,200.00.

4. Total approximate cost for the entire installation, therefore, will be $125,200.00 plus $82,400.00 or approximately $207,600.00.

NOTE: The following costs should be added to the above figures: builders' work; wellway protection; lighting; outside balustrades and/or plaster.

Applications

IN STORES

Electric Stairways have their widest application in multi-floor stores where several floors of merchandise must be conveniently accessible to large numbers of customers. Here, fifty to ninety percent of sales areas are removed from the ground or first floor.

Electric Stairways, combined with proper elevator service to form a balanced vertical transportation system, contribute invaluably to greater merchandising, economy of transportation, conservation of sales space and to modernization. New stores, both small and large, find the moving stairway a necessary adjunct. A study of existing stores will usually reveal sufficient operating savings and sales potential to economically justify the installation of Electric Stairways.

OFFICE BUILDINGS

The modern trend in new office buildings has been towards the use of the Electric Stairway as both a convenience and as an economical capital expenditure to conserve space and reduce the elevator requirements.

Electric Stairways are particularly adaptable to handle the heavy incoming morning traffic and outgoing evening traffic as well as the interfloor traffic.

This is particularly true for buildings having several floors devoted to single tenants and large populations.

Stairways form the ideal means of uniting mezzanine, first floor and concourse into a single shopping area.

RAILROAD TERMINALS AND SUBWAYS

The continually moving Electric Stairway is the answer to the large demand in transporting crowds from and to the train platforms. The reversibility of the stairways provides considerable flexibility in synchronizing terminal transportation with train schedules. Electric Stairways are the only practical means in a railroad terminal or subway to provide transportation of crowds from one level to another.

AIR TERMINALS

Similar in character to that of the railroad terminal is the problem of conveniently handling the crowds between levels of the air terminal. No other means of vertical transportation is as convenient or economical as the Electric Stairway.

BANKS

Modern banking can be successfully conducted on a second floor by means of the quiet, streamlined Electric Stairway to conduct patrons to and from the banking floor, thus providing additional banking facilities or permitting use of the street-level floor for various commercial purposes.

Economy in operation and constant readiness to serve are factors which have induced their use.

MISCELLANEOUS

Varied applications present their peculiar value and problems: schools, restaurants, factories, hotels, garages, kitchens to dining room, etc., where convenience, readiness to serve, economy, prestige, and modernization are factors which promote the consideration of the Electric Stairway.

SECTION 6

Arrangements and Layouts

A. POWER REQUIREMENTS

1. Standard Electric Stairways are driven by 10-HP and 15-HP motors.

MOTOR APPLICATION

Stwy	Motor HP	Rise Feet	Full Load Amperes 220 v	Starting Amperes 220 v
32L	10	23	30	103
48L	15	15-23	42	166

Standard power supply: 208-220-440-volt, 3-phase, 60-cycle

2. Power lines must be brought to the circuit breaker in the top-end section of the truss by others.

3. Generally, feeders are provided to each floor to serve a pair of Electric Stairways since most installations have both up and down service. However, no more than four Electric Stairways are recommended for a single feeder.

B. ARRANGEMENT

1. Electric Stairways may be arranged either *Criss-Cross* or *Parallel*, and each arrangement may be either *Adjacent* or *Separated.*

2. The Criss-Cross arrangement *(see figure 25)* is generally preferred since it requires minimum space and enables the store customer to view a wide expanse of the store. When adjacent, the installation is more economical. When separated, the stairways provide greater inducement to cross circulation as well as greater visibility – factors which are important in some installations.

3. The Parallel arrangement *(see figure 26),* though less efficient in space requirements, provides a more expansive appearance and better visibility for the passengers.

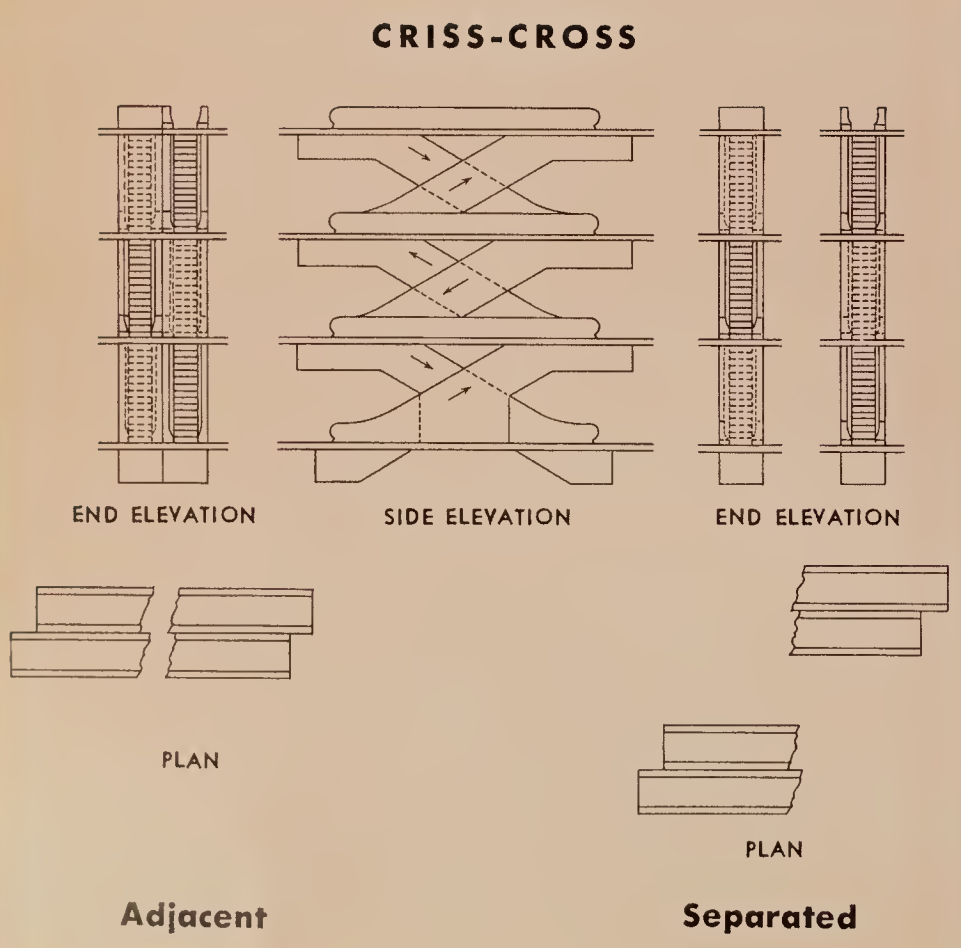


Figure 25. Criss-Cross Arrangement

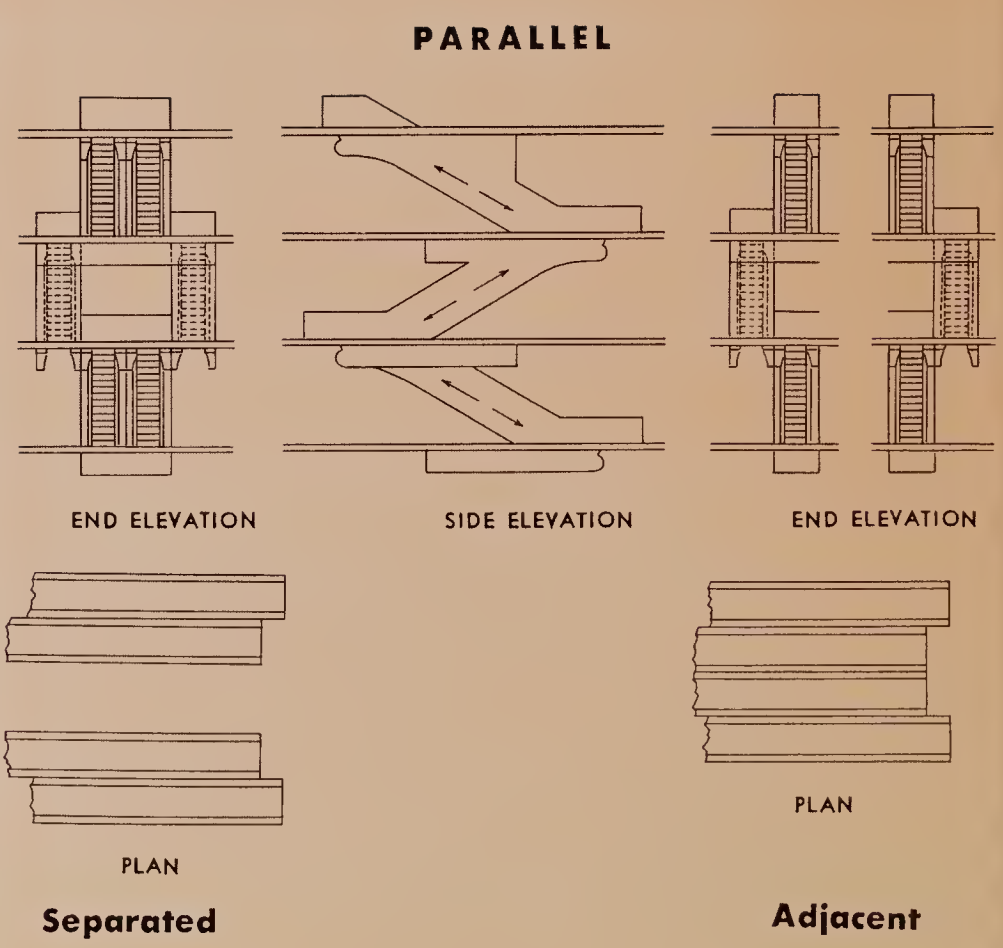


Figure 26. Parallel Arrangement

C. LOCATION *(see figure 27)*

1. Because of the various arrangements possible with Electric Stairways, their installation can easily be adapted to the physical shape and layout of the building. The following objectives should determine the choice of location:

a. First-floor locations should be chosen so that the Electric Stairways provide a direct extension of the established lanes of traffic, which are determined primarily by the entrances to the building.

b. Upper-floor locations should be chosen not only to meet any special conditions, but to integrate the entire Electric Stairway system for maximum convenient access to all areas.

c. The stairway system should so relate one stairway to another as to allow a continuous flow of passengers—an automatic movement up, down, and around.

d. Particularly in stores, each Electric Stairway should be as conspicuous as possible and passengers riding on it should have an expansive view of the floor.

2. In new buildings, the objectives mentioned above are generally easy to accomplish. In existing buildings, however, special problems of physical layout must be met and consideration given to walls, columns, framing, and to factors of cost and space evaluation.

3. Electric Stairway installations can often be so planned as to centralize the entire transportation system of the building. Possibly a number of existing elevators can be removed and replaced by Electric Stairways, thereby effecting a saving in installation and operating costs.

D. LAYOUTS

1. Basic layouts for the two standard Westinghouse Electric Stairways are given in figure 28 (type 32L) and in figure 29 (type 48L).

2. Layouts of details and arrangements of the Electric Stairways are given in figures 30 to 39 inclusive.

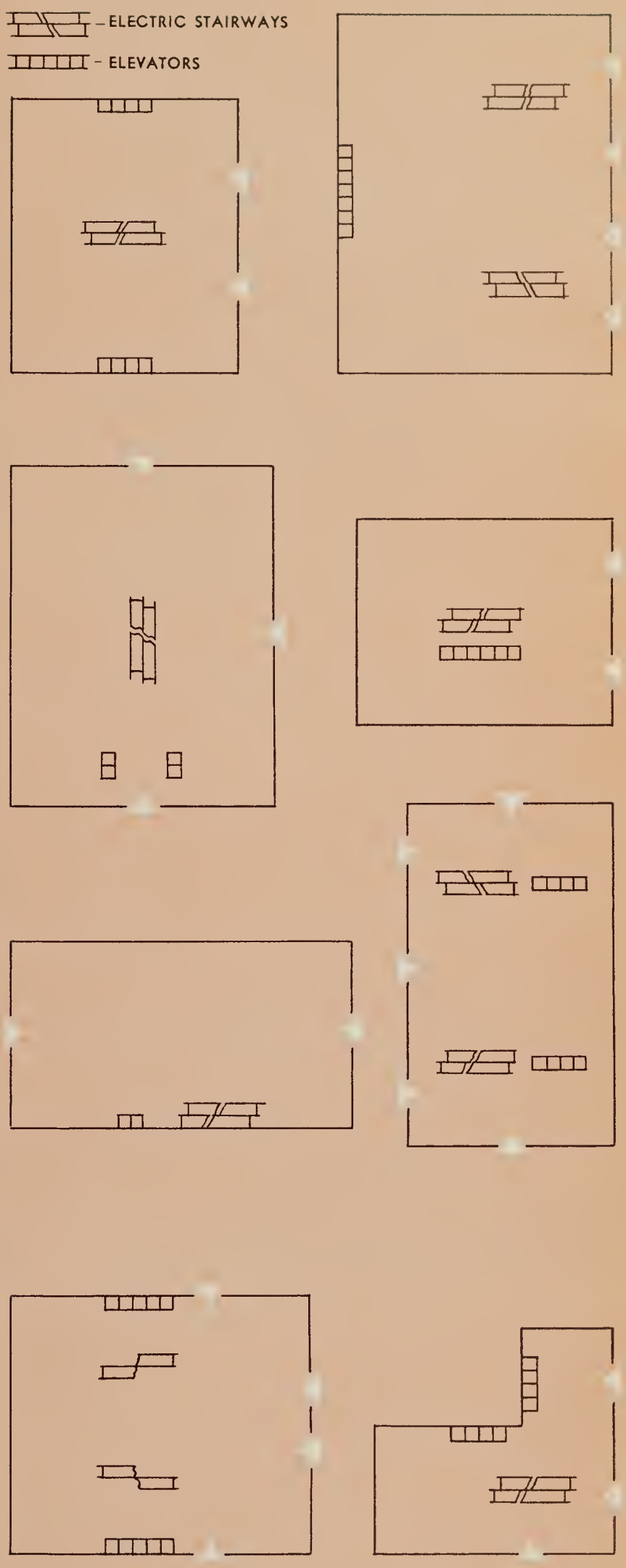
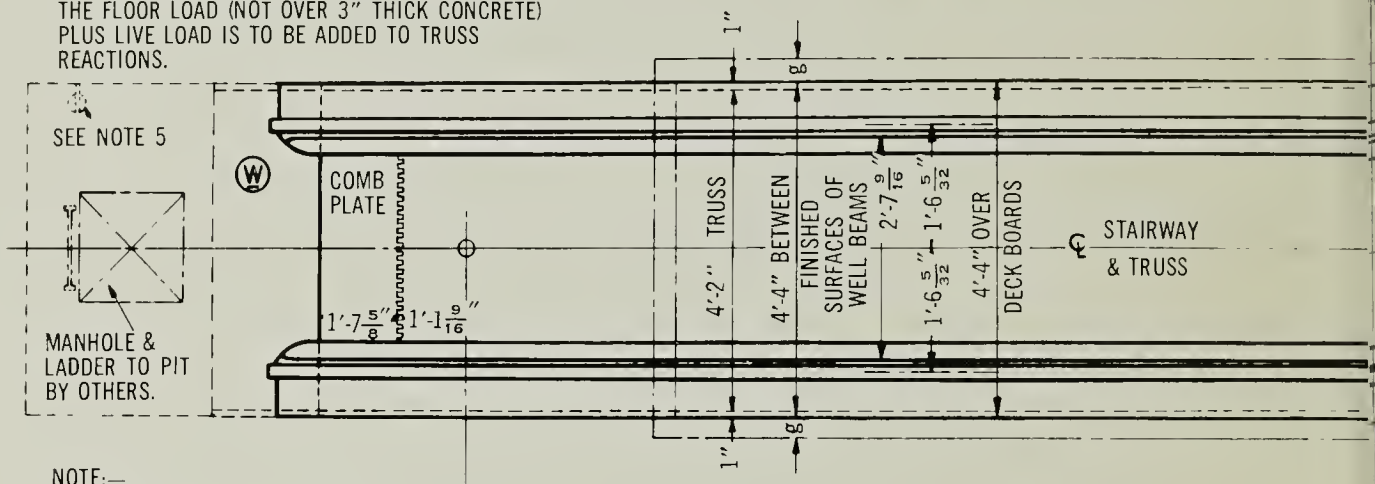


Figure 27. Typical Transportation System Arrangements

TYPE 32L ELECTRIC STAIRWAY

NOTE TRUSS EXTENSIONS:—
IF TRUSS EXTENSION CARRIES PART OF FLOORING, THE FLOOR LOAD (NOT OVER 3" THICK CONCRETE) PLUS LIVE LOAD IS TO BE ADDED TO TRUSS REACTIONS.



NOTE:—
FLOOR PLATES AT TOP & BOTTOM LANDINGS MARKED Ⓦ ARE BY WECO. FINISHED FLOORING OVER BY OTHERS. SEE DS-594 & 595 FOR DETAILS.

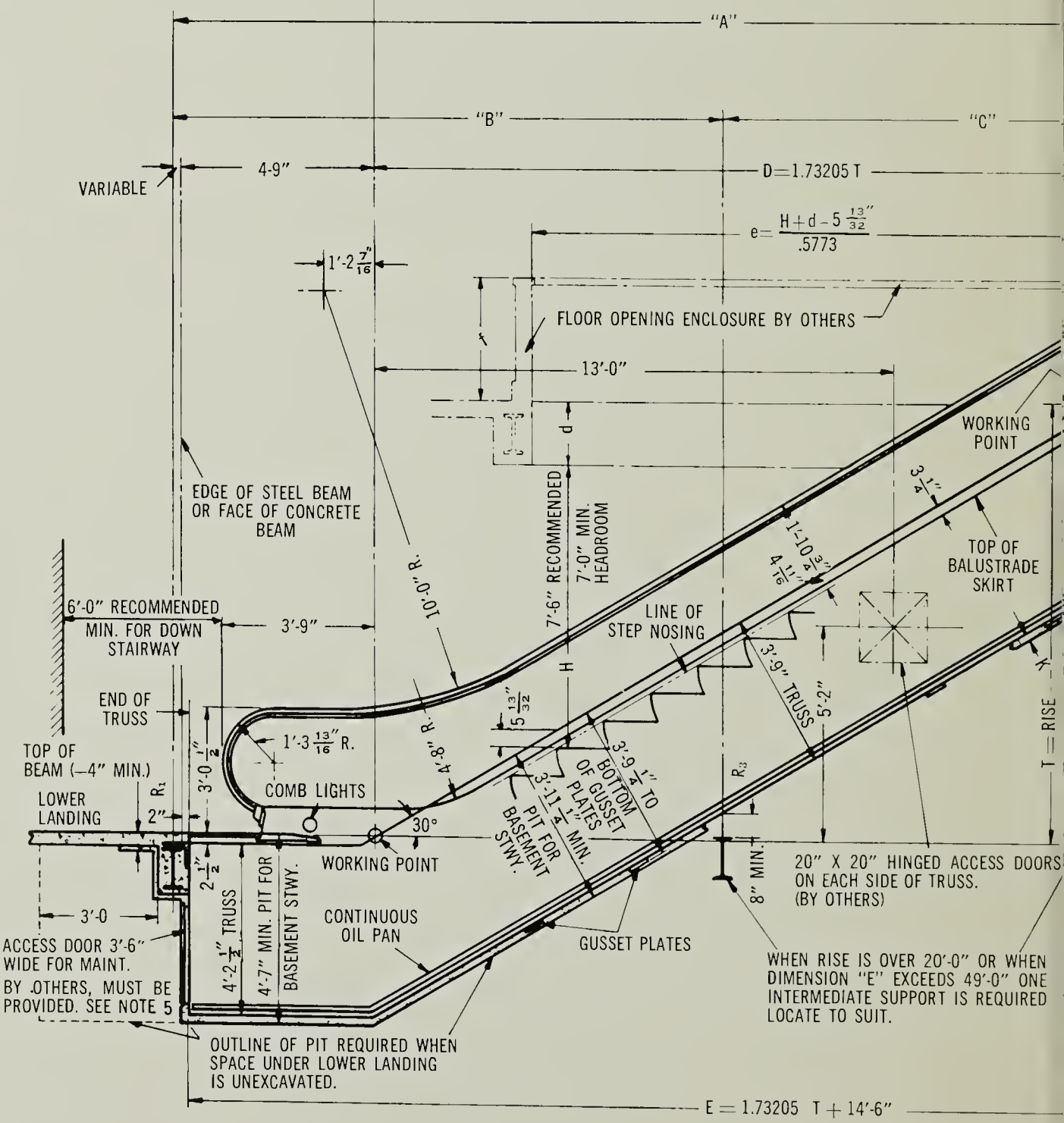


Figure 28. Layout for

DS-593

MACHINE	MAX. RISE IN FEET
32 L	23'-0"

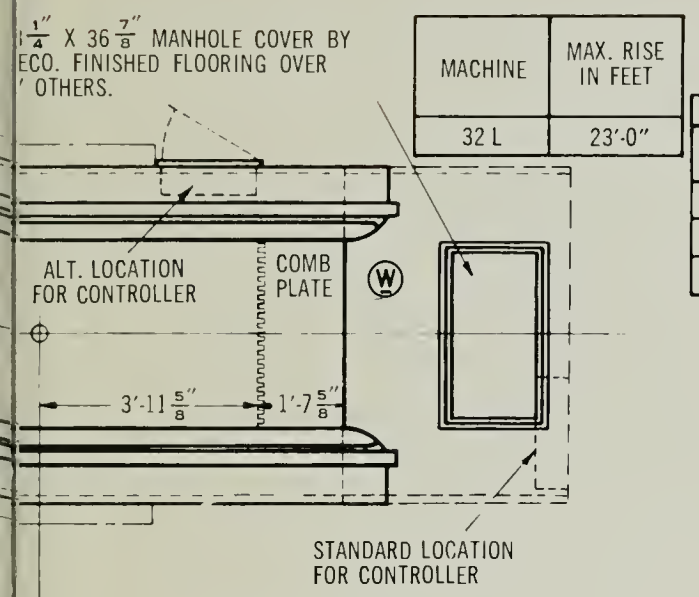
REACTIONS		
NO INTERMEDIATE SUPPORT	WITH INTERMEDIATE SUPPORT WHEN "B" IS LESS THAN "C"	WITH INTERMEDIATE SUPPORT WHEN "B" IS GREATER THAN "C"
$R_1 = 324\,A + 2500$	$R_1 = [(324\,A) + 2500]\frac{A}{A+C}$	$R_1 = [(648\,A) + 5000]\frac{B}{A+B}$
$R_2 = 324\,A + 2500$	$R_2 = [(648\,A) + 5000]\frac{C}{A+C}$	$R_2 = [(324\,A) + 2500]\frac{A}{A+B}$
	$R_3 = [(324\,A) + 2500]\frac{A}{A+C}$	$R_3 = [(324\,A) + 2500]\frac{A}{A+B}$

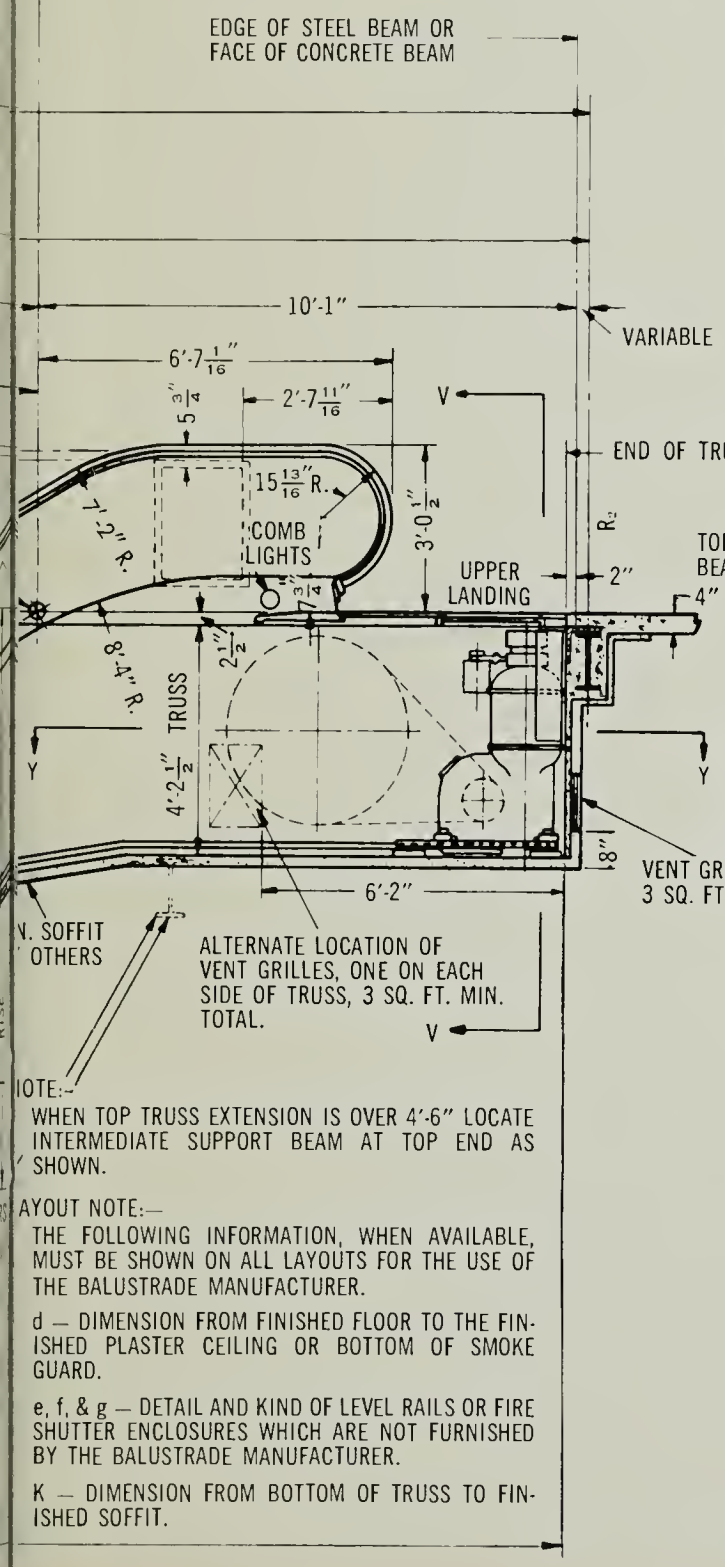
OWNER TO PROVIDE AND INSTALL THE FOLLOWING:

1. ALL ELECTRIC STAIRWAY SUPPORTS, INCLUDING BEARING PLATES IF CONCRETE BEAMS ARE USED.
2. FRAMING FOR CONTROLLER IF LOCATED IN WELL RAILING.
3. MANHOLE & LADDER TO PIT, FOR BASEMENT STAIRWAYS.
4. 3 PHASE, 60 CYCLE POWER SUPPLY AND 110 VOLT LIGHT SUPPLY TO CONTROLLER.
5. COMBINATION LAMP RECEPTACLE & CONVENIENCE OUTLET IN MACHINE ROOM (IN TRUSS) & RECOMMENDED IN PIT FOR BASEMENT STAIRWAYS & AT ACCESS DOOR, BOTTOM OF STAIRWAY, FOR MAINTENANCE.
6. VENT GRILLES FOR MACHINE ROOM & ALL OTHER ITEMS MARKED "BY OTHERS."
7. PAPER BACKED WIRE LATH OR ITS EQUIVALENT TO BE USED FOR PLASTER ENCLOSING THE STAIRWAY.

— NOTES —

8. FLOOR AROUND ELECTRIC STAIRWAY IS NOT TO BE LAID UNTIL ELECTRIC STAIRWAY IS INSTALLED.
9. TRUSS SUPPORT BEAMS ARE NOT TO BE FIREPROOFED UNTIL TRUSS IS IN PLACE.
10. FLOORING WITHIN 8" OF WECO FLOOR PLATES, TOP & BOTTOM, IS NOT TO BE LAID UNTIL FLOOR PLATES ARE IN PLACE.
11. ELECTRIC CONDUITS, SPRINKLER PIPES OR SOFFIT LIGHTS MUST BE INSTALLED ENTIRELY OUTSIDE OF TRUSS AT ALL POINTS. INCREASE SOFFIT FURRING TO COVER.
12. NO WALLS OR OTHER PARTS OF BUILDING STRUCTURE ARE TO BE CARRIED ON TRUSS.





IOTE:-
WHEN TOP TRUSS EXTENSION IS OVER 4'-6" LOCATE INTERMEDIATE SUPPORT BEAM AT TOP END AS SHOWN.

AYOUT NOTE:—
THE FOLLOWING INFORMATION, WHEN AVAILABLE, MUST BE SHOWN ON ALL LAYOUTS FOR THE USE OF THE BALUSTRADE MANUFACTURER.

d — DIMENSION FROM FINISHED FLOOR TO THE FINISHED PLASTER CEILING OR BOTTOM OF SMOKE GUARD.

e, f, & g — DETAIL AND KIND OF LEVEL RAILS OR FIRE SHUTTER ENCLOSURES WHICH ARE NOT FURNISHED BY THE BALUSTRADE MANUFACTURER.

K — DIMENSION FROM BOTTOM OF TRUSS TO FINISHED SOFFIT.

Type 32L Electric Stairway

TYPE 48L ELECTRIC STAIRWAY

NOTE—TRUSS EXTENSIONS:—
IF TRUSS EXTENSION CARRIES PART OF FLOORING, THE FLOOR LOAD (NOT OVER 3" THICK CONCRETE) PLUS LIVE LOAD IS TO BE ADDED TO TRUSS REACTIONS.

NOTE:—
FLOOR PLATES AT TOP & BOTTOM LANDINGS MARKED Ⓦ ARE BY WECO. FINISHED FLOORING OVER BY OTHERS.

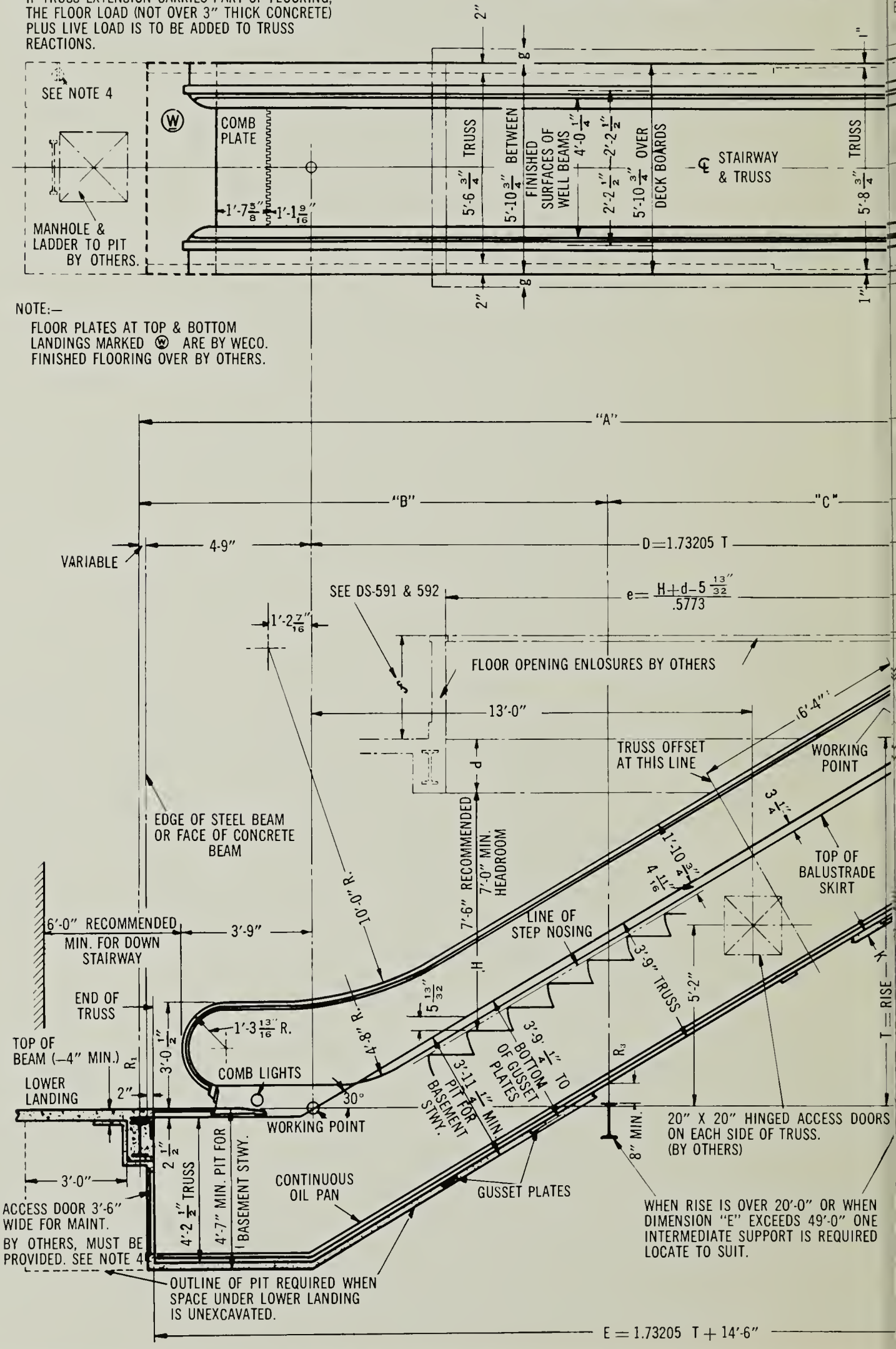
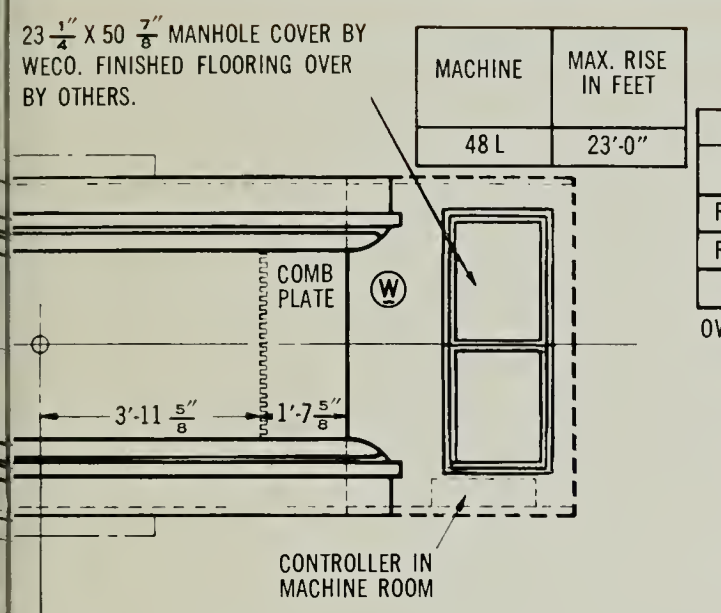


Figure 29. Layout for

DS-590

MACHINE	MAX. RISE IN FEET
48 L	23'-0"

REACTIONS		
NO INTERMEDIATE SUPPORT	WITH INTERMEDIATE SUPPORT WHEN "B" IS LESS THAN "C"	WITH INTERMEDIATE SUPPORT WHEN "B" IS GREATER THAN "C"
$R_1 = 440\,A + 4000$	$R_1 = [440\,A + 4000]\frac{A}{A+C}$	$R_1 = [880\,A + 8000]\frac{B}{A+B}$
$R_2 = 440\,A + 4000$	$R_2 = [880\,A + 8000]\frac{C}{A+C}$	$R_2 = [440\,A + 4000]\frac{A}{A+B}$
	$R_3 = [440\,A + 4000]\frac{A}{A+C}$	$R_3 = [440\,A + 4000]\frac{A}{A+B}$



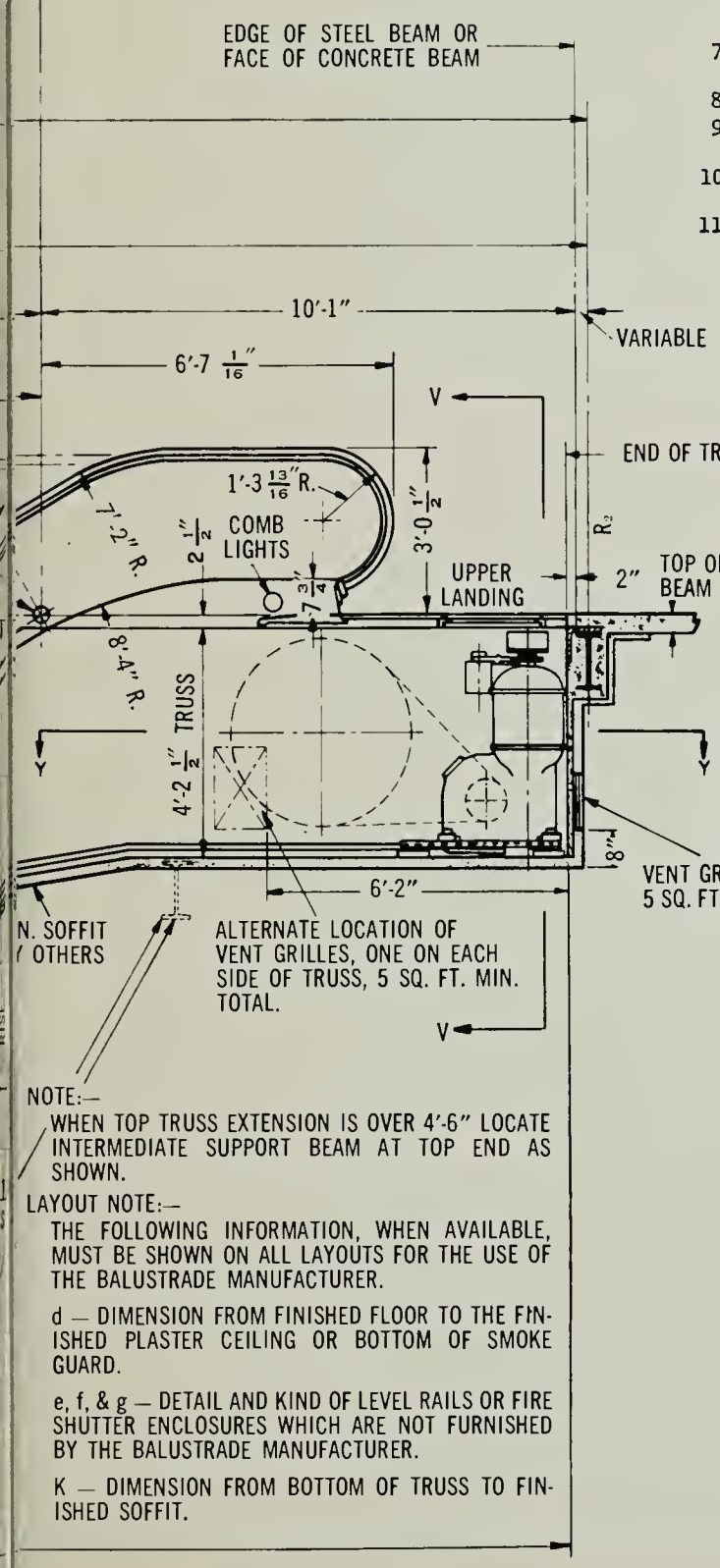
OWNER TO PROVIDE AND INSTALL THE FOLLOWING:

OWNER TO PROVIDE AND INSTALL THE FOLLOWING:

1. ALL ELECTRIC STAIRWAY SUPPORTS, INCLUDING BEARING PLATES IF CONCRETE BEAMS ARE USED.
2. MANHOLE & LADDER TO PIT, FOR BASEMENT STAIRWAYS.
3. 3 PHASE, 60 CYCLE POWER SUPPLY AND 110 VOLT LIGHT SUPPLY TO CONTROLLER.
4. COMBINATION LAMP RECEPTACLE & CONVENIENT OUTLET IN MACHINE ROOM (IN TRUSS) & RECOMMENDED IN PIT FOR BASEMENT STAIRWAYS & AT ACCESS DOOR, BOTTOM OF STAIRWAY, FOR MAINTENANCE.
5. VENT GRILLES FOR MACHINE ROOM & ALL OTHER ITEMS MARKED "BY OTHERS."
6. PAPER BACKED WIRE LATH OR ITS EQUIVALENT TO BE USED FOR PLASTER ENCLOSING STAIRWAY.

— NOTES —

7. FLOOR AROUND ELECTRIC STAIRWAY IS NOT TO BE LAID UNTIL ELECTRIC STAIRWAY IS INSTALLED.
8. TRUSS SUPPORT BEAMS ARE NOT TO BE FIREPROOFED UNTIL TRUSS IS IN PLACE.
9. FLOORING WITHIN 8" OF WECO FLOOR PLATES, TOP & BOTTOM, IS NOT TO BE LAID UNTIL FLOOR PLATES ARE IN PLACE.
10. ELECTRIC CONDUITS, SPRINKLER PIPES OR SOFFIT LIGHTS MUST BE INSTALLED ENTIRELY OUTSIDE OF TRUSS AT ALL POINTS. INCREASE SOFFIT FURRING TO COVER.
11. NO WALLS OR OTHER PARTS OF BUILDING STRUCTURE ARE TO BE CARRIED ON TRUSS.



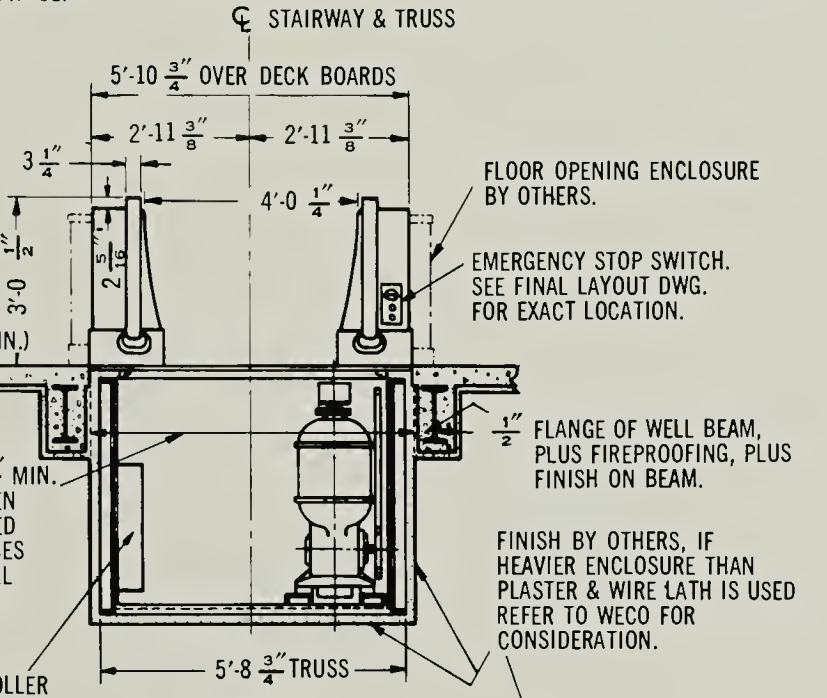
NOTE:—
WHEN TOP TRUSS EXTENSION IS OVER 4'-6" LOCATE INTERMEDIATE SUPPORT BEAM AT TOP END AS SHOWN.

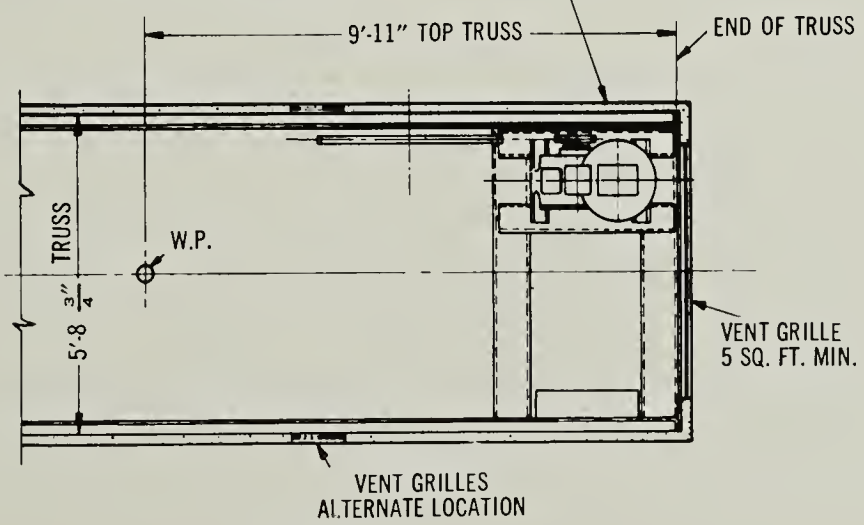
LAYOUT NOTE:—
THE FOLLOWING INFORMATION, WHEN AVAILABLE, MUST BE SHOWN ON ALL LAYOUTS FOR THE USE OF THE BALUSTRADE MANUFACTURER.

d — DIMENSION FROM FINISHED FLOOR TO THE FINISHED PLASTER CEILING OR BOTTOM OF SMOKE GUARD.

e, f, & g — DETAIL AND KIND OF LEVEL RAILS OR FIRE SHUTTER ENCLOSURES WHICH ARE NOT FURNISHED BY THE BALUSTRADE MANUFACTURER.

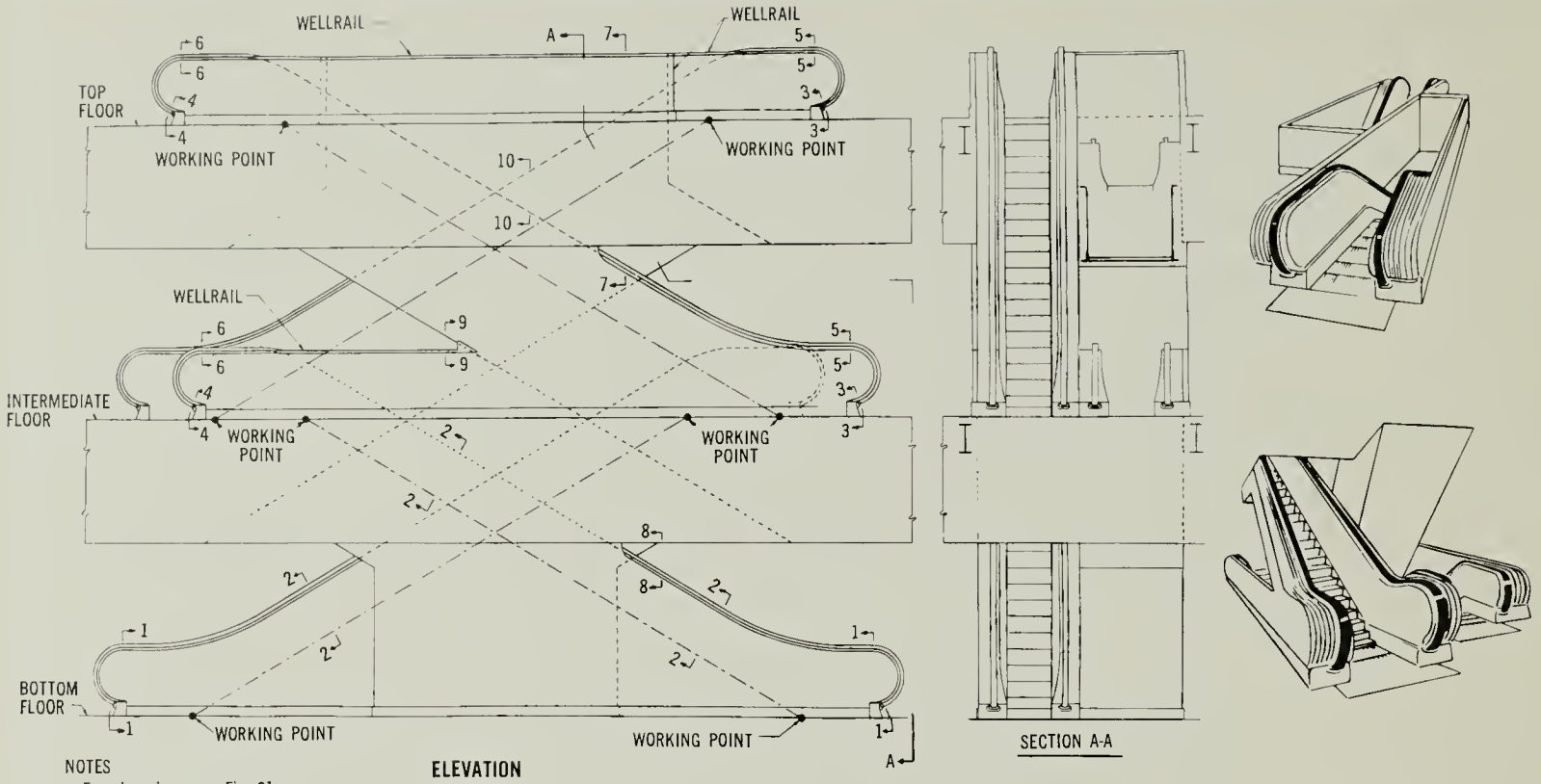
K — DIMENSION FROM BOTTOM OF TRUSS TO FINISHED SOFFIT.





PLAN VIEW Y-Y
(MACHINE ROOM)

Type 48L Electric Stairway



NOTES

For plan views see Fig. 31

For Sections 1-1 and 2-2 see Fig. 32.

For Sections 3-3 to 6-6 see Fig. 33 for exterior plaster covering and Fig. 35 for exterior marble covering

For Section 7-7 see Fig. 33 for exterior plaster covering and Fig. 34 for exterior marble covering

For Sections 8-8 and 9-9 see Fig. 35

For Section 10-10 see Fig. 34

Figure 30. Criss-Cross Arrangement–Wellway Railing Elevation

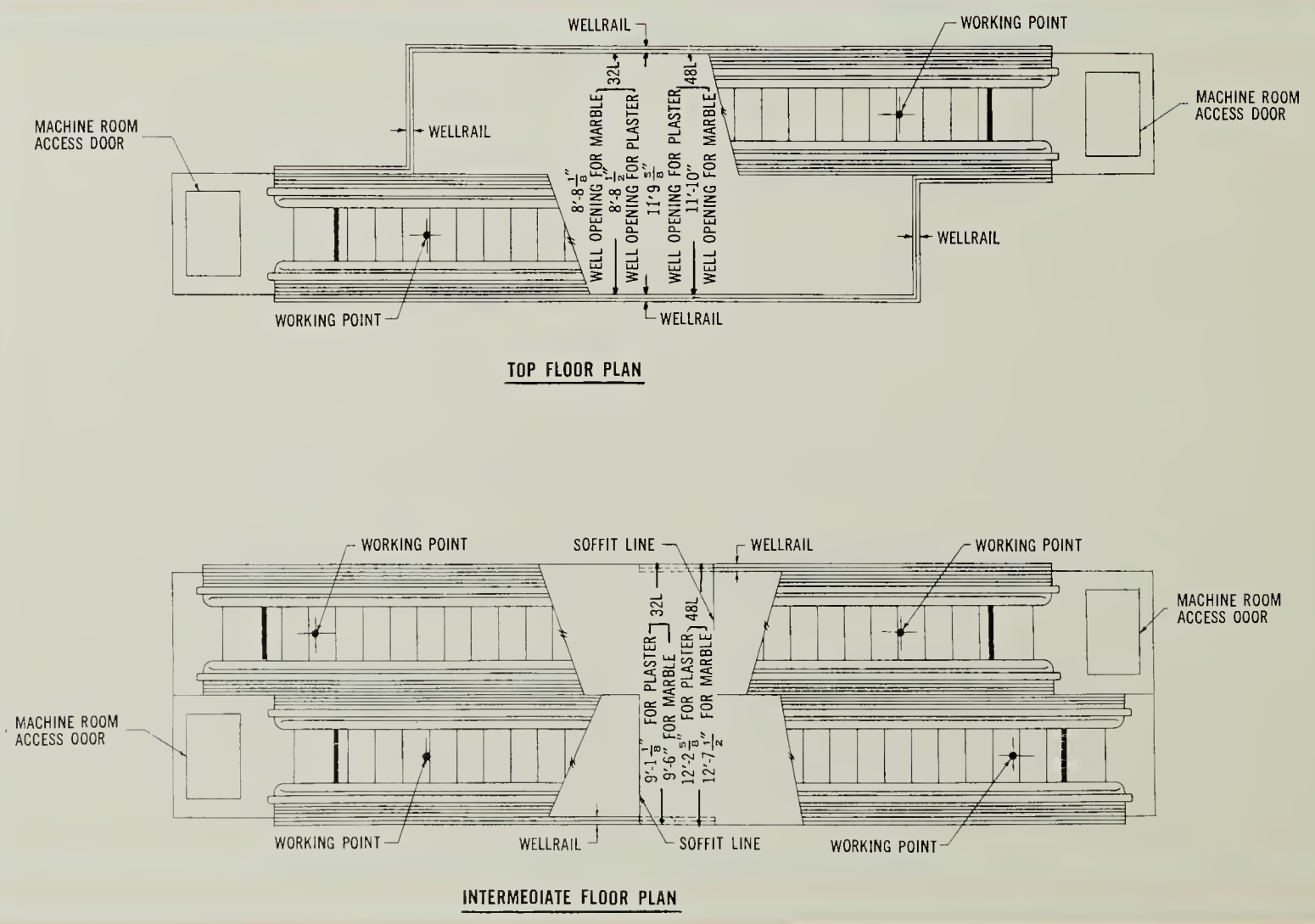


Figure 31. Criss-Cross Arrangement–Wellway Railing Plan

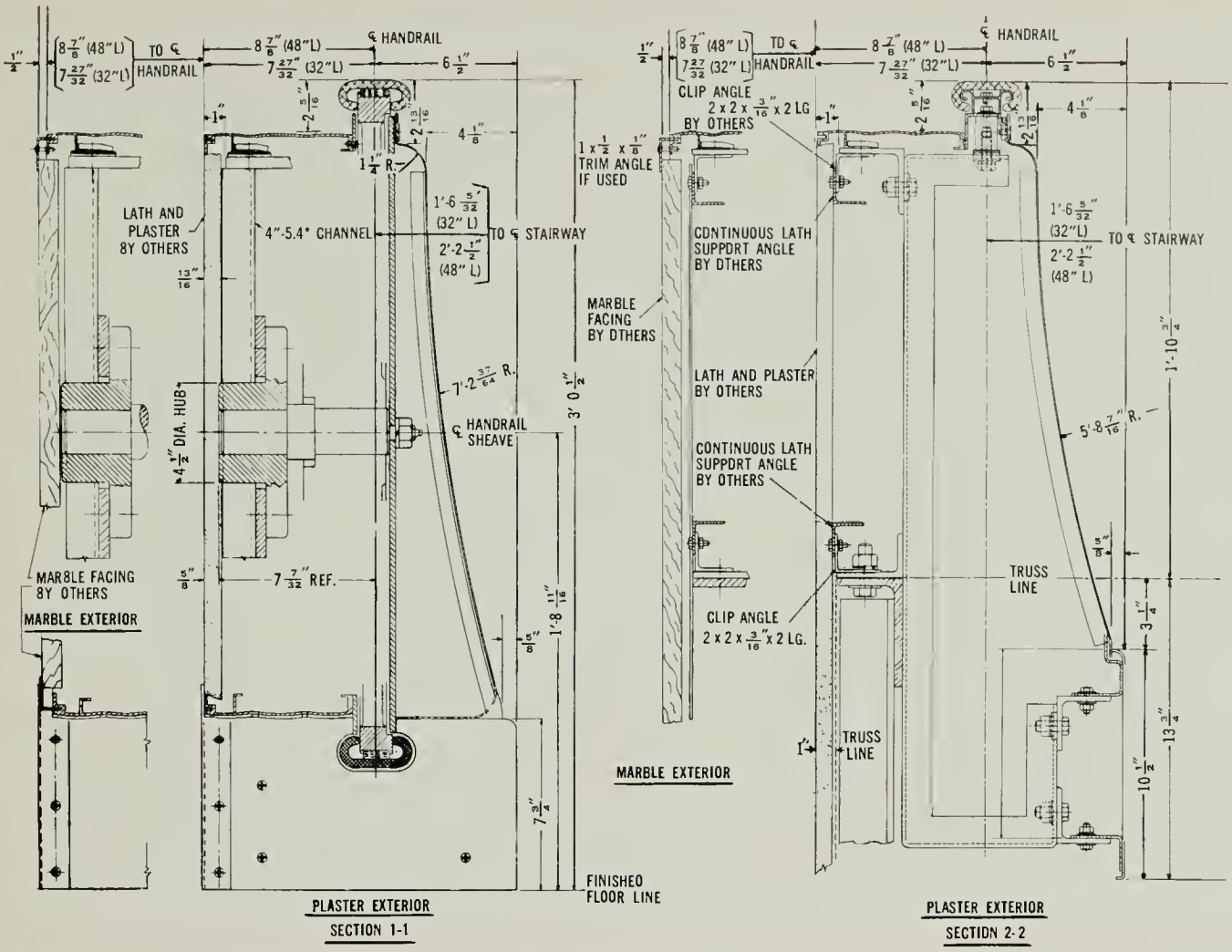


Figure 32. Sections Through Balustrade—Plaster or Marble Exteriors

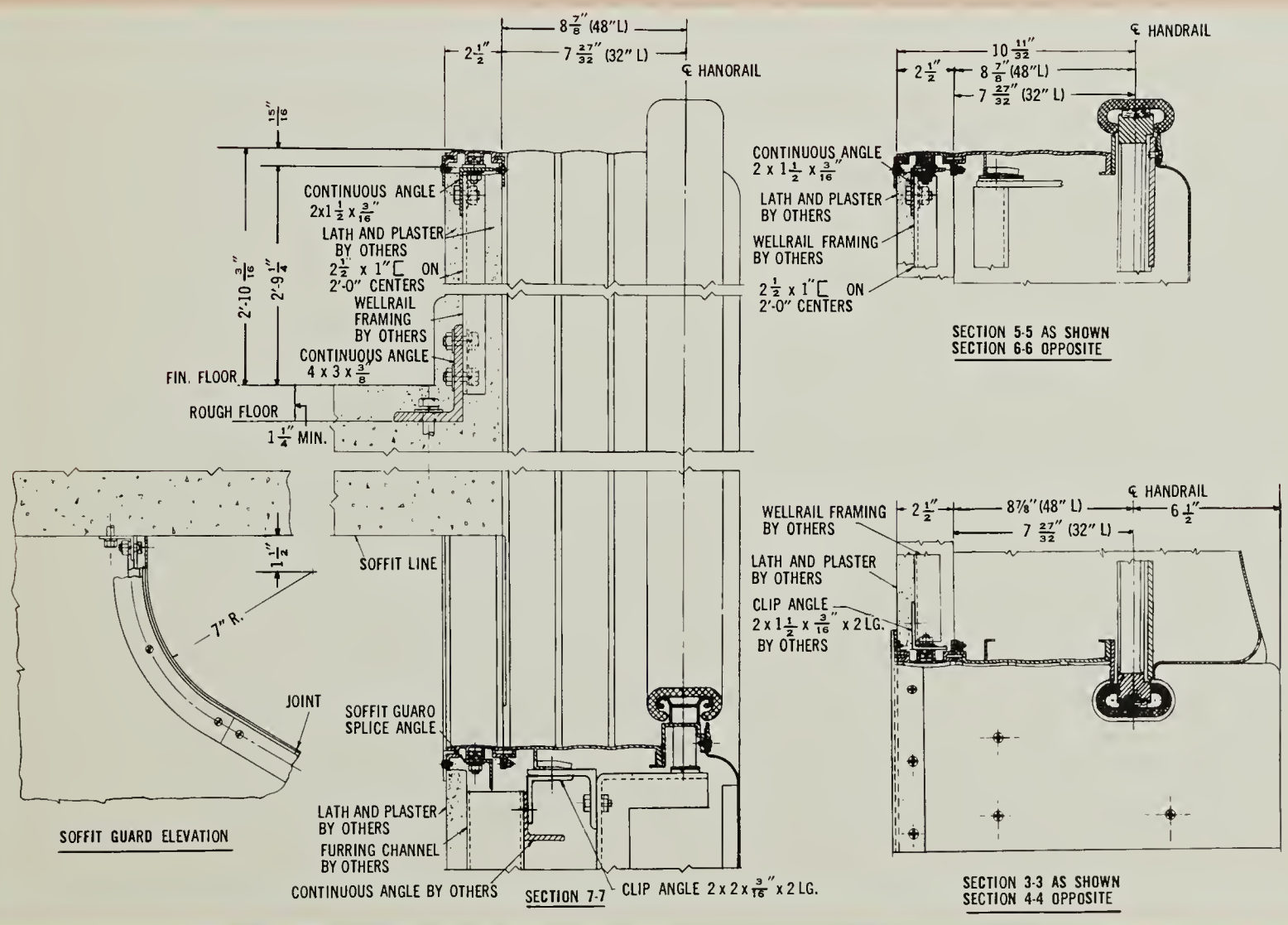


Figure 33. Sections Through Balustrade—Wellway Railing—Plaster Exterior

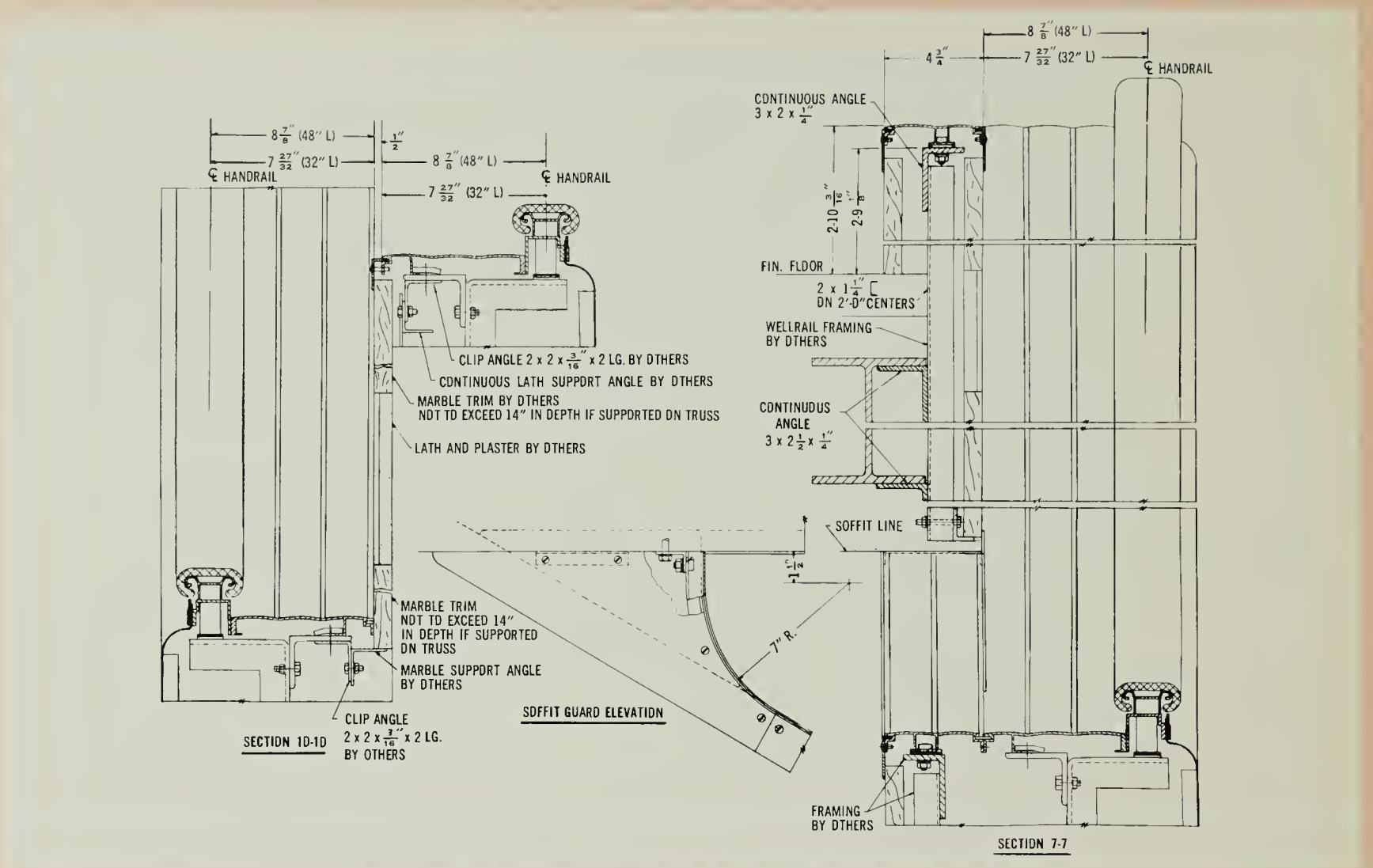


Figure 34. Sections Through Balustrade–Wellway Railing–Marble Exterior

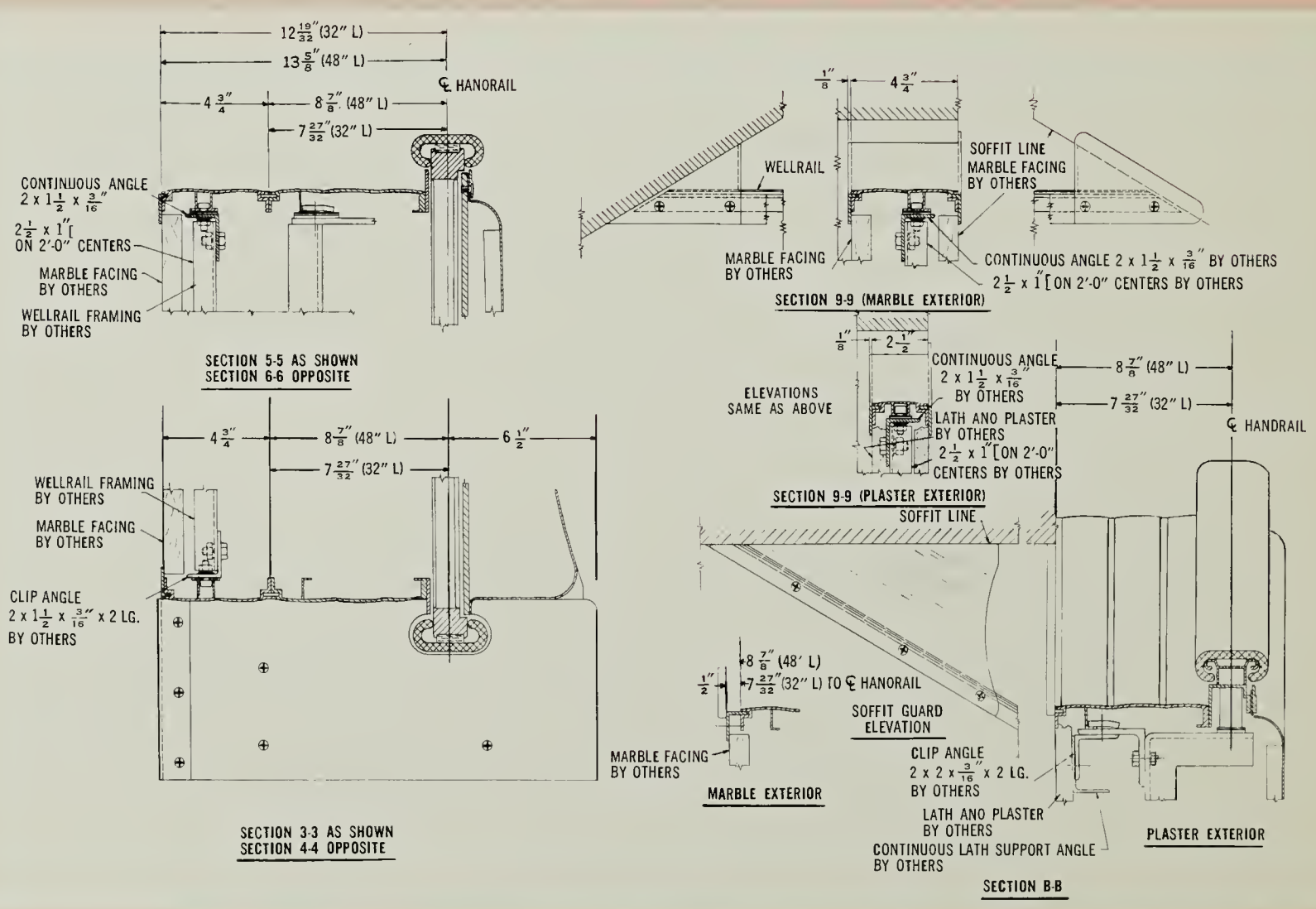


Figure 35. Wellway Railing Details–Plaster or Marble Exteriors

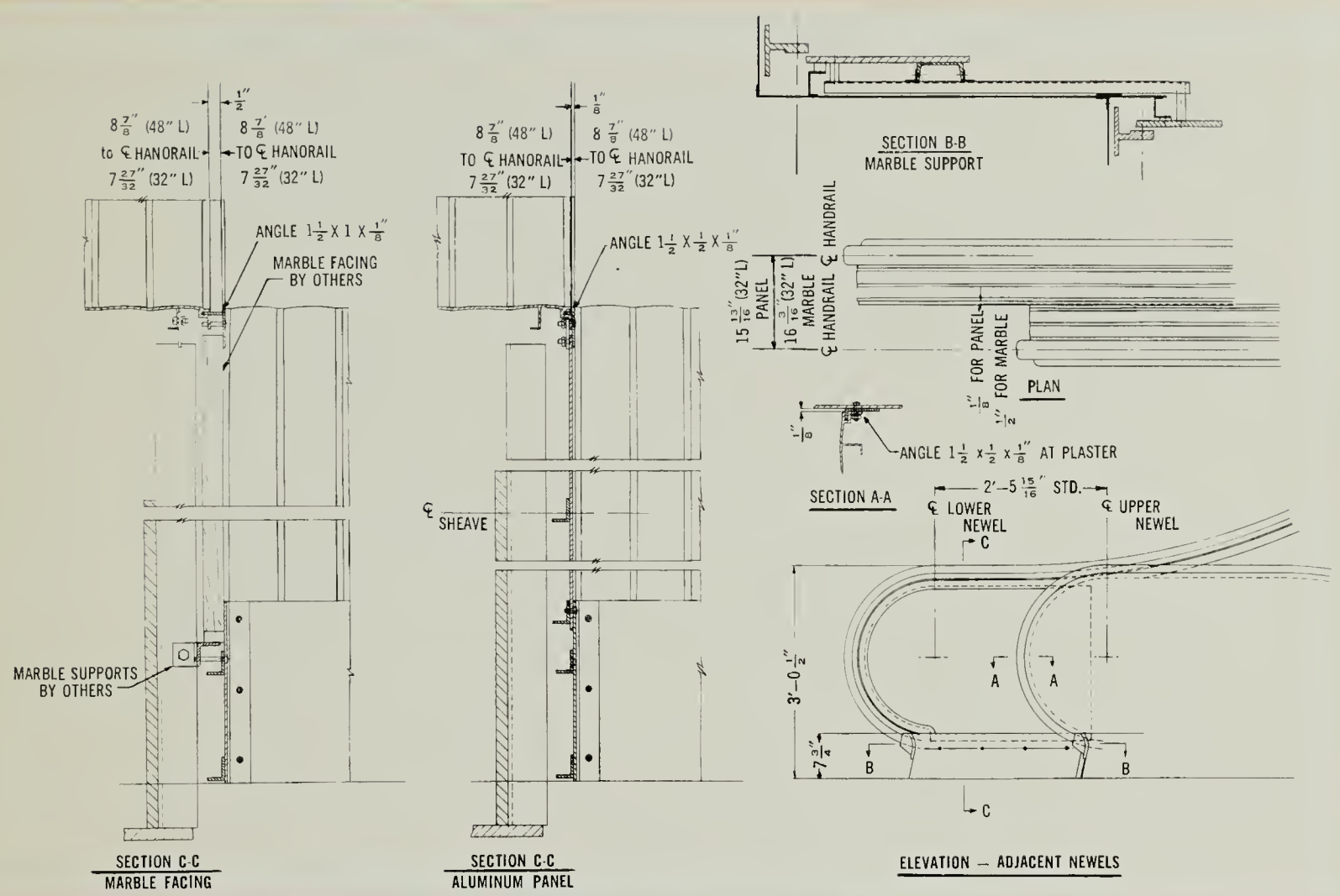


Figure 36. Treatment of Newel Exteriors

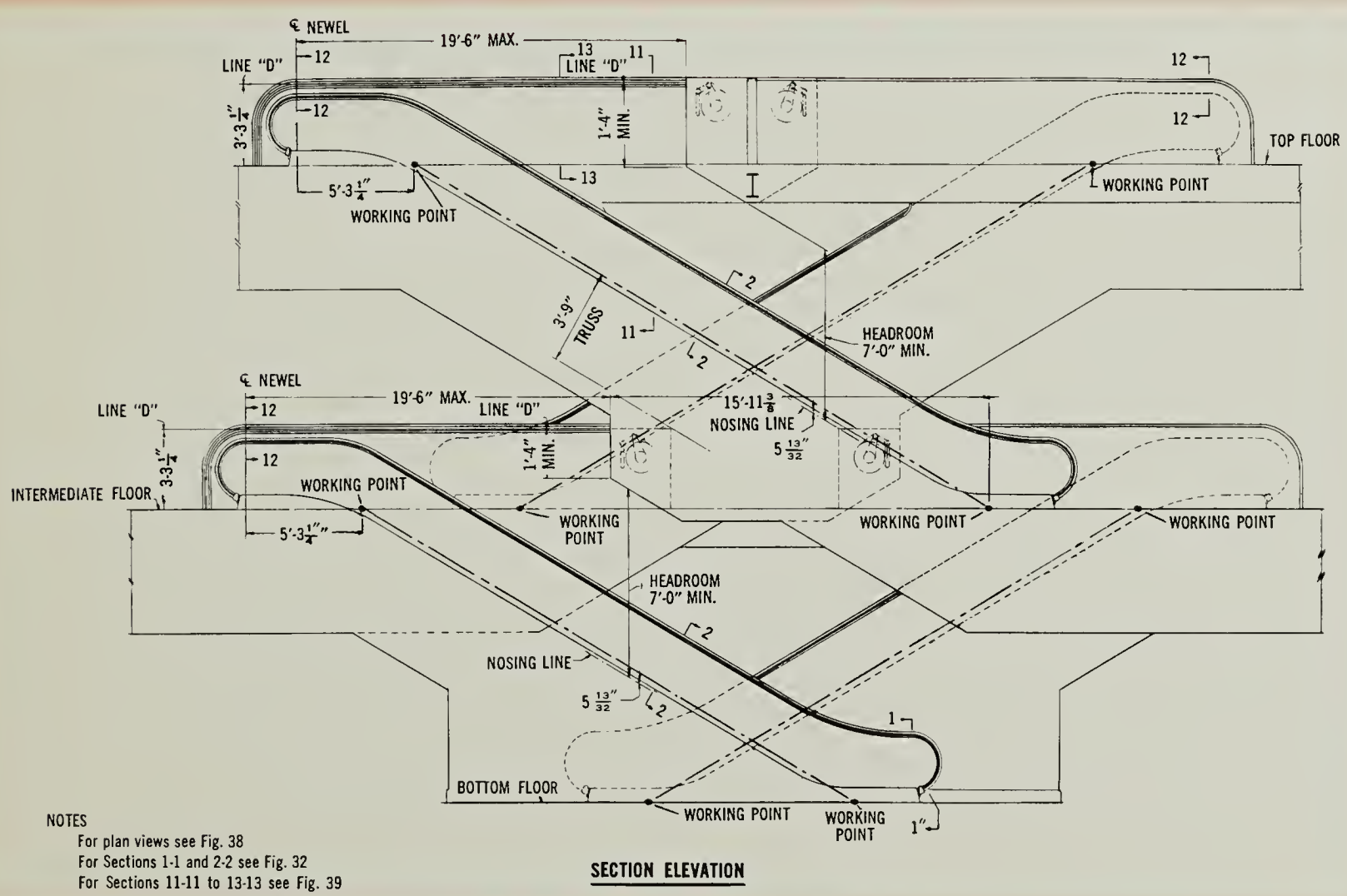
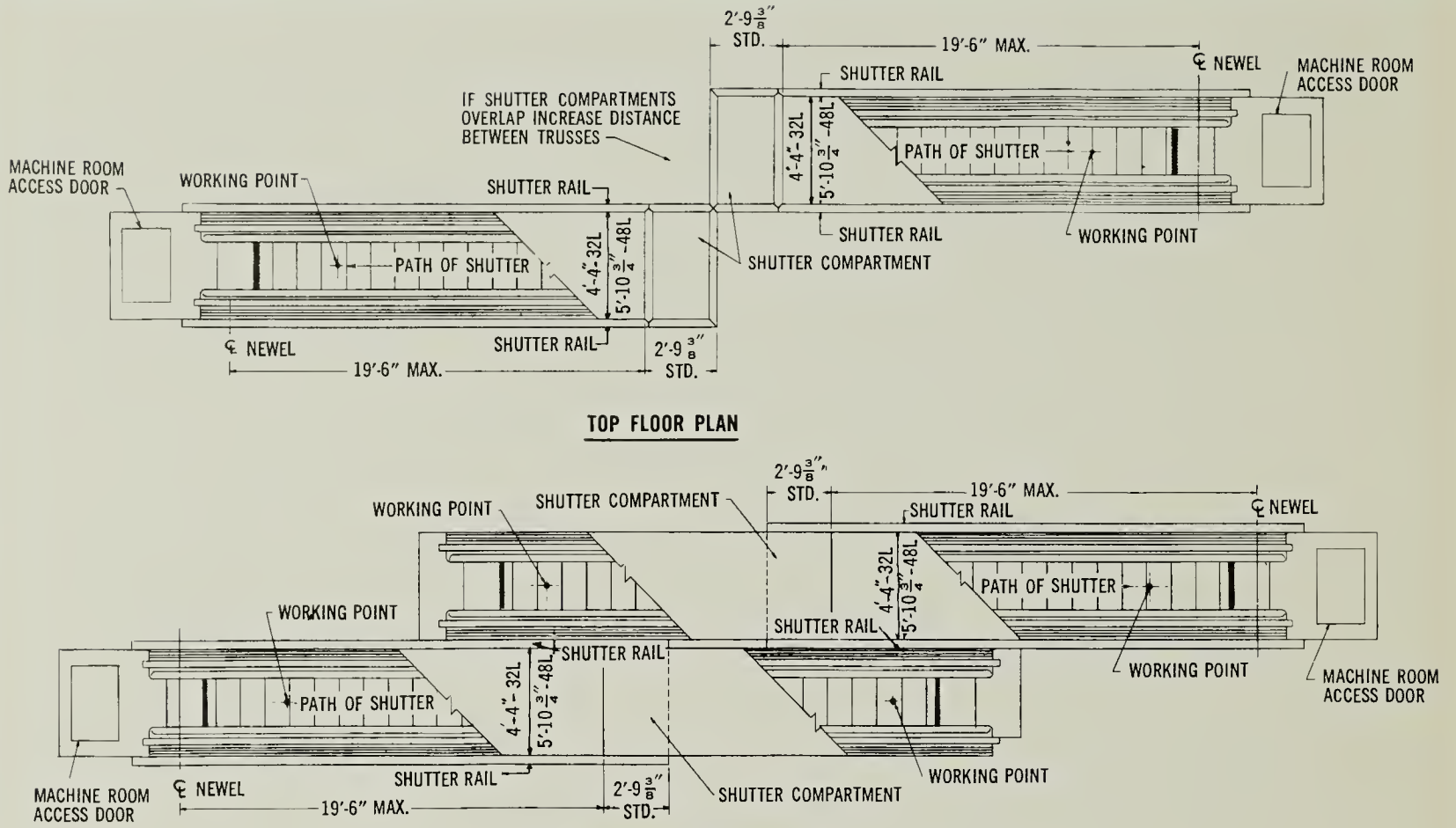


Figure 37. Criss-Cross Arrangement—Fire Shutter Elevation



NOTE
For Section elevation see Fig. 37

Figure 38. Criss-Cross Arrangement—Fire Shutter Plan

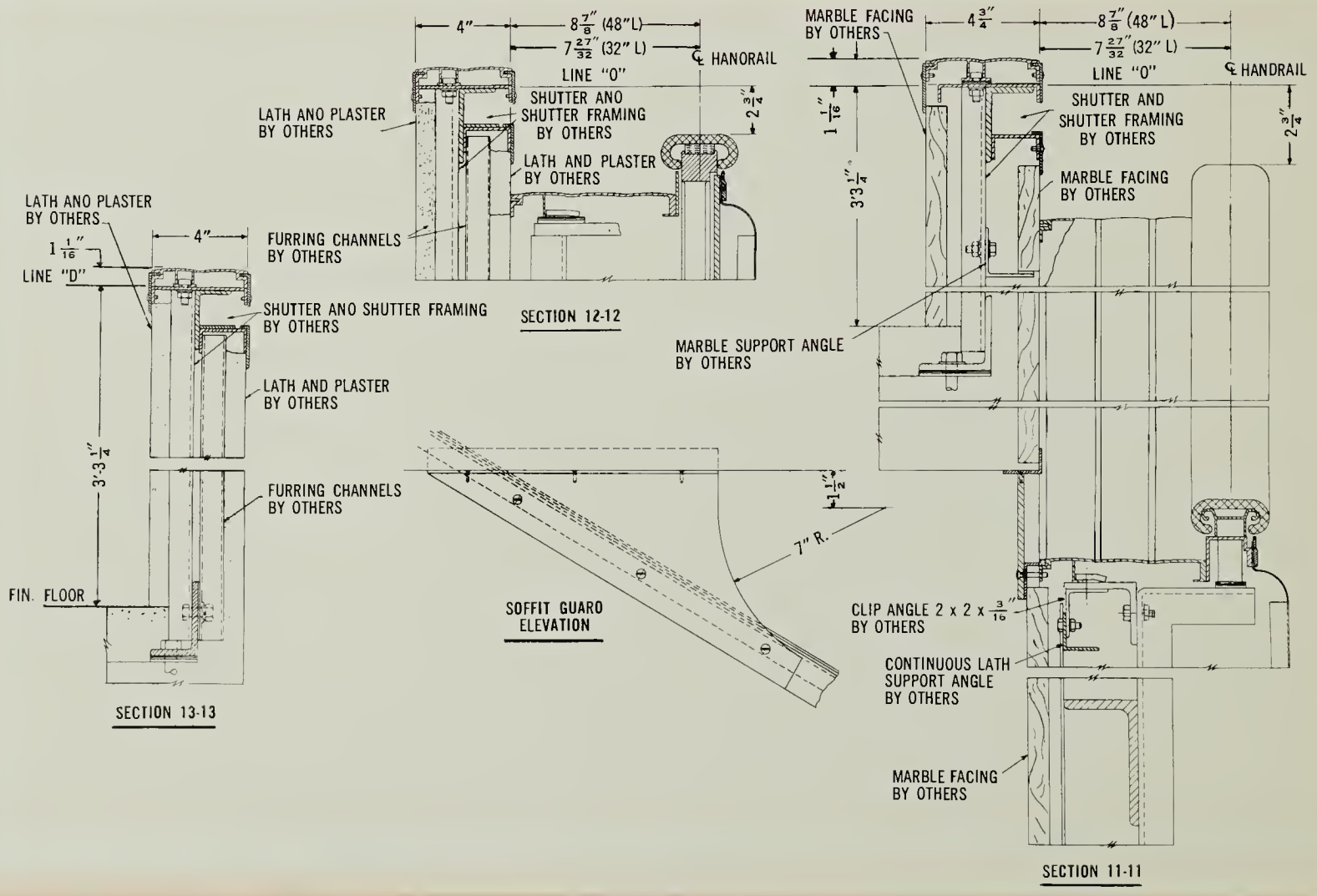


Figure 39. Sections Through Balustrade—Fire Shutter—Plaster or Marble Exteriors

Modernization

Usually, modernization is brought about because of a desire to improve conditions or appearance, to reduce expense, to increase revenue, to provide greater capacity, to gain space.

The Electric Stairway has received major exploitation as a modernization vehicle, particularly in multi-floor stores.

In stores, Electric Stairways are usually easily justified because they frequently satisfy all the reasons for modernization. Here, they are the means of gaining prestige—they provide convenience and contribute to the capacity of handling the traffic which has increased in the older stores.

Their substitution for existing elevators has frequently led to considerable economy. Their space requirements are such that frequently in replacing elevators there is made available sales or other valuable space. They are a means of securing a capacity commensurate with the store size. Undoubtedly, they contribute to greater sales.

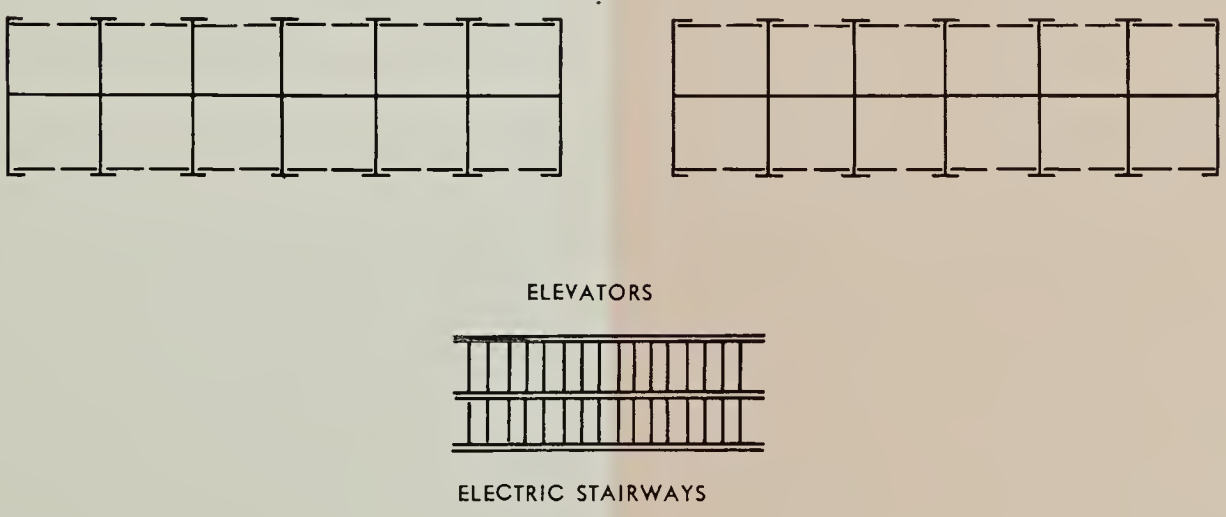
Installation can usually be accomplished with little interruption of normal business. Further, the space requirements minimize the building framing and construction involved. *They fit into most structures.* They largely remove the use of stairs and the hazards (accidents) connected with stairs.

Whether you're planning a new building or modernizing an old one, the installation of Westinghouse Electric Stairways will provide the most convenient, economical, and efficient means of moving masses of people up and down. . . . In existing buildings, the installation of Westinghouse Electric Stairways may be the most important element of a modernization program.

In any modernization program, the facts should be known and analyzed.

At all times, Westinghouse engineers are ready to cooperate with your consultants in analyzing your transportation needs.

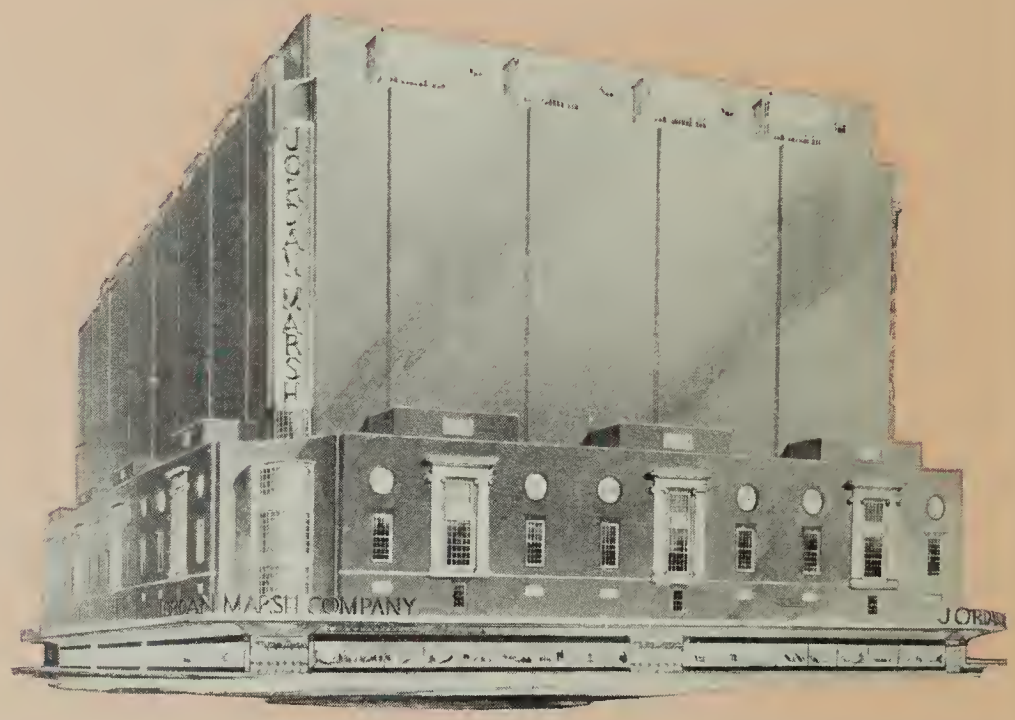
Figure 40. Relative Space Requirements



This diagram shows the marked savings in space requirements of Electric Stairways compared to elevators. Both means of vertical transportation provide equivalent capacity for a typical multi-floor store.

Typical Westinghouse Electric

OFFICE BUILDING



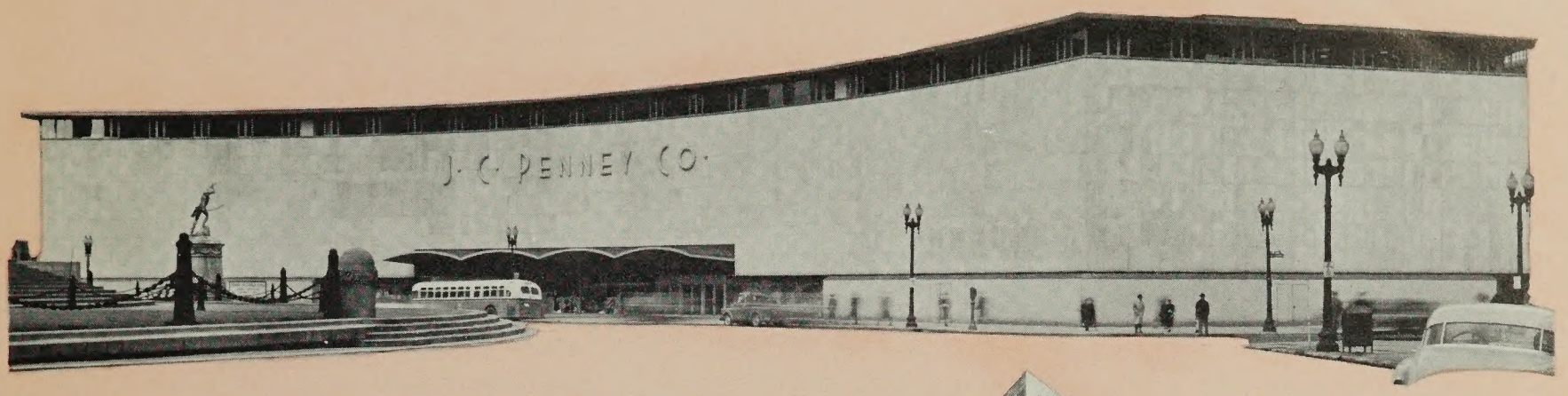
STORE

STORE

BANK

RAILROAD TERMINAL

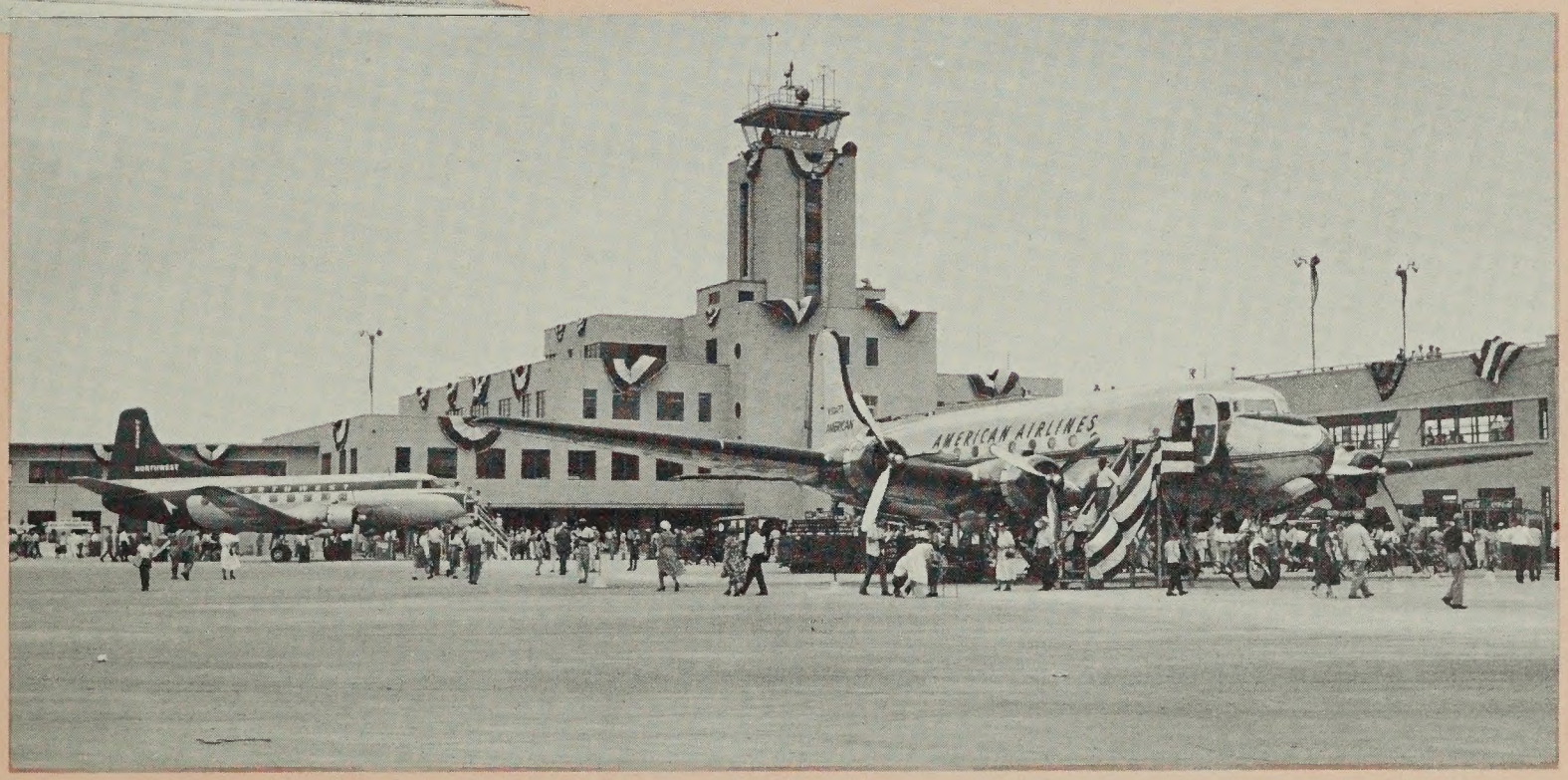
Stairway Installations



STORE

OFFICE BUILDING

STORE



AIR TERMINAL

Protective Maintenance

A Westinghouse Protective Maintenance Agreement will relieve the owner of the responsibilities of vertical transportation maintenance problems and worries. Under this contract, Westinghouse agrees to take all responsibility for proper operating conditions of the Electric Stairways. The contract provides for labor, materials, and necessary parts required to insure operating efficiency.

Here are eight of the big advantages of Westinghouse Protective Maintenance:

1. **Maximum Safety and Smooth Operation**
2. **Greater Passenger Satisfaction**
3. **Increased All-Around Economy**
4. **No Unexpected Large Repair Bills**
5. **24-Hour Service at All Times**
6. **Longer Electric Stairway Life**
7. **Genuine Westinghouse Parts**
8. **Complete Westinghouse Facilities**

Westinghouse Protective Maintenance is paid for on a monthly basis, thus permitting accurate budgeting of all Electric Stairway maintenance costs on a predetermined, fixed-charge basis. The three-page, easily understood contract covers in detail the responsibilities Westinghouse will assume, the work it will do, and the service it will give.

Thousands of satisfied building managers throughout the country attest to the value of this maintenance plan. By turning over the safe-keeping of your Electric Stairways to Westinghouse, you are assured of positive protection and trouble-free operation.

ELEVATOR DIVISION

WESTINGHOUSE ELECTRIC CORPORATION • JERSEY CITY 4, NEW JERSEY

Sales Offices

Atlanta 2, Ga., 1299 Northside Dr., N.W.
Atlantic City, N. J., 4100 So. Atlantic Ave.

Baltimore 2, Md., 501 St. Paul Pl.
Bartlesville, Okla., B-42 Adams Bldg.
Baton Rouge, La., 207 N. 4th St.
Birmingham 2, Ala., 327 Brown-Marx Bldg.
Boston 10, Mass., 10 High St.
Bronx 51, N. Y., 260 E. 161st St.
Brooklyn 2, N. Y., 32 Court St.
Buffalo 3, N. Y., 832 Ellicott Sq. Bldg.

Charleston 23, W. Va., 179 Summer St.
Charlotte, N. C., 210 E. 6th St.
Chattanooga 4, Tenn., 505 E. 8th St.
Chicago 10, Ill., 920 N. Clark St.
Cincinnati 2, Ohio, 419 Provident Bank Bldg.
Cleveland 13, Ohio, 614 Superior Ave., W.
Columbus 15, Ohio, 262 N. 4th St.
Corpus Christi, Texas, 326 Kaffie Bldg.

Dallas 1, Texas, 1614 Canton St.
Dayton 2, Ohio, 32 N. Main St.
Denver 2, Colo., 1010 Gas & Electric Bldg.
Des Moines 8, Iowa, Equitable Bldg.
Detroit 32, Mich., 5757 Trumbull Ave.
Dubuque, Iowa, Locust & 8th Sts.

Evansville 8, Ind., 106 Vine St.

Flint 3, Mich., 1815 Glendale Ave.
Fort Worth, Tex., Natl. Bank Bldg., 7th & Main St.

Grand Rapids, Mich., 301 McKay Tower

Harrisburg, Pa., 112 No. 2nd St.
Hartford 5, Conn., 186 S. Whitney St.
Houston 2, Texas, 507 Dallas Ave.

Indianapolis 4, Ind., 315 N. Capitol Ave.

Jackson, Miss., 610 Millsaps Bldg.
Jacksonville, Fla., 233 Duval St.
Johnstown, Pa., 406 Main St.

Kansas City 6, Mo., 101 W. 11th St.

Lansing 10, Mich., 221 S. Magnolia Ave.
Lincoln, Neb., Stuart Bldg.
Little Rock, Ark., 707 Boyle Bldg.
Los Angeles 17, Calif., 600 St. Paul Ave.
Louisville 2, Ky., 332 West Broadway
Lubbock, Texas, 2324 Indiana St.

Madison, Wisc., 206 So. Orchard St.
Manchester, N. H., 147 Hanover St.
Memphis 3, Tenn., 825 Exchange Bldg.
Miami 45, Fla., 1763 S. W. 3rd Ave.
Milwaukee 2, Wis., 538 N. Broadway
Minneapolis 15, Minn., 400 S. 4th St.

Nashville, Tenn., Third National Bank Bldg.
Newark 2, N. J., 17 Academy St.
New Haven 11, Conn., 89 Howe St.
New Orleans 13, La., 856 Carondelet St.
New York 20, N. Y., 9 Rockefeller Plaza

Oklahoma City, Okla., 130 W. Grand Ave.
Omaha 2, Neb., 310-12 S. 24th St.,

Peoria, Ill., 100 Michael Ct., East Peoria
Philadelphia 4, Pa., 3001 Walnut St.
Pittsburgh 19, Pa., 18 Terminal Way
Portland 12, Ore., 626 N. Tillamook St.
Providence 3, R. I., 51 Empire St.

Raleigh, N. C., Durham Life Insurance Bldg.
Reading, Pa., 524 No. Court St.
Rochester, Minn., 2119-3rd St., S.W.

Sacramento 14, Calif., 926 J St.
St. Louis 1, Mo., 1507 Ambassador Bldg.
Salem, Oregon, 4045 Alana Ave.
San Diego 1, Calif., 525 "E" St.
San Francisco 7, Calif., 715 Harrison St.
Scranton, Pa., 2073 N. Main St.
Seattle 1, Wash., 5528 White-Henry-Stuart Bldg.
Shreveport, La., 306 Milam St.
South Bend, Ind., 107 Jefferson Ave.
Springfield 3, Mass., 26 Vernon St.
Syracuse 4, N. Y., 4030 New Court Rd.

Trenton 9, New Jersey, 743 E. State St.
Tulsa 3, Okla., 703 Wright Bldg.

Washington 6, D. C., 1112-21st St., N.W.
Wheeling, W. Va., National Bank Bldg., 12th & Main St.
Wichita 2, Kan., 211 S. Main St.
Wilkes-Barre, Pa., 267 No. Pennsylvania Ave.
Wilmington 99, Del., 400 S. Market St.

Youngstown 3, Ohio, 25 E. Boardman St.

YOU CAN BE SURE...IF IT'S Westinghouse

B-4582C
A.I.A. File 33-E1

5M/4-56

Printed in U. S. A.